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APPENDIX A

**ASSESSMENT OF
PACIFIC GAS AND ELECTRIC CORPORATION AND
PACIFIC GAS AND ELECTRIC COMPANY'S
SAFETY CULTURE**

**PREPARED FOR
CALIFORNIA PUBLIC UTILITIES COMMISSION
MAY 8, 2017**

FINAL REPORT



NORTHSTAR CONSULTING GROUP

MANAGEMENT CONSULTANTS

SANTA MARIA, CA ♦ LAS VEGAS, NV ♦ SAN FRANCISCO, CA ♦ SAN DIEGO, CA

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CHAPTER I: EXECUTIVE SUMMARY

On August 27, 2015, the California Public Utilities Commission (CPUC or Commission) opened an investigation to determine whether Pacific Gas and Electric Company's (PG&E) and PG&E Corporation's (PG&E Corp.) organizational culture and governance prioritize safety and adequately direct resources to promote accountability and achieve safety goals and standards (I.15-08-019 *Order Instituting Investigation to Determine Whether PG&E and PG&E Corporation's Organizational Culture and Governance Prioritize Safety* (Safety Culture Investigation or OII)). During the first phase of the proceeding, the Commission directed the Commission's Safety and Enforcement Division (SED) to evaluate PG&E's and PG&E Corp.'s organizational culture, governance, policies, practices, and accountability metrics in relation to PG&E's record of operations, including its record of safety incidents, and to produce a report on the issues and questions contained in the OII.

NorthStar Consulting Group, Inc. (NorthStar) was selected to perform the assessment. The review began in April 2016. Detailed fieldwork was conducted from May through December 2016. On December 30, 2016, PG&E provided NorthStar with a detailed "whitepaper" describing the safety-related activities that it had undertaken since San Bruno. During the course of the investigation, NorthStar reviewed the responses to nearly 900 information requests and conducted more than 250 interviews. A number of the interviews were field visits which resulted in discussions with more than one employee.

A. SUMMARY

While PG&E is committed to safety and efforts have been made to reduce incidents and increase the organizational focus on safety, these efforts have been somewhat reactionary — driven by immediate needs and an understandable sense of urgency, rather than a comprehensive enterprise-wide approach to addressing safety. PG&E moved quickly to address the issues with its gas system surfaced by San Bruno, but was slower in addressing its safety culture. As a result, the extent to which the desired culture is embedded in the organization varies among lines of business (LOB) and other organizations, and between the corporate offices and the field. Gas Operations and Power Generation have more robust implementation than Electric Transmission & Distribution (Electric T&D). PG&E has placed considerable emphasis on changing the culture of management personnel and this is evident in the corporate offices. Field personnel generally believe management is committed to safety, but in many respects it is business as usual in the field, or the field locations are working to address safety issues on their own.

With the exception of the change in the discipline policy and its efforts to foster a "speak up" environment, PG&E has only recently begun to address safety culture on an enterprise-wide basis. The absence of a comprehensive strategy has resulted in the lack of coordination between corporate safety and the field functions and the introduction of numerous initiatives aimed at improving safety without a coordinated approach. Initiatives driven by the field or lessons learned within an LOB are not adequately transmitted across the organization to maximize the benefit of internal best practices. Delays in the development or

implementation of a plan have been exacerbated by the two-president model, line of business silos, the lack of management personnel with safety experience, re-organization and considerable turnover within corporate safety, and the lack of a comprehensive understanding of the issues and underlying causes.

B. BACKGROUND

On September 9, 2010, at approximately 6:11 P.M., a portion of PG&E's 30-inch diameter underground natural gas transmission system (Line 132) suddenly ruptured. Operating at approximately 386 pounds per square inch gauge (psig), the pipeline was located under the asphalt paving at the intersection of Glenview Drive and Earl Avenue in a residential area of San Bruno, California. Installed in 1956, the 28-foot long section of Segment 180 Line 132 that failed consisted of five segments which were propelled into the air and landed about 100 feet away. An explosion ensued, fueled by blowing natural gas. The explosion and fire resulted in the loss of eight lives and the total destruction of 38 homes. Sixty-six people were injured.¹ Seventy homes sustained damage and eighteen homes adjacent to the destroyed dwellings were left uninhabitable.²

On September 23, 2010, the CPUC approved Resolution No. L-403, which included the formation of an Independent Review Panel (IRP) of experts. The IRP's purpose was to gather and review facts and make recommendations to the CPUC for the improvement of the safe management of PG&E's natural gas transmission lines.

On June 24, 2011, the IRP issued its report, citing a "dysfunctional culture" at PG&E in which the goals of its enterprise risk management process were disconnected from the reality, decisions, and actions throughout the company. "...[PG&E] management made a faulty assumption. It did not make the connection among its high level goals, its enterprise risk management process and the work that was actually going on in the company."³ The IRP Report determined, "this failing is a product of the culture of the company – a culture whose rhetoric does not match its practices."⁴ This dysfunctional culture, the IRP Report concluded, appeared based on excessive levels of management, inconsistent presence of subject matter expertise in the management ranks, an appearance-led strategy setting, an insularity that impeded its ability to judge its effectiveness, and an overemphasis on financial performance. The IRP also cited a lack of "process excellence," which was explained as a failure of communication resulting from siloed, or segregated, business enterprises that should have, but failed to, communicate with each other. Importantly, the IRP indicates that PG&E's culture failed to explain and acculturate the live link that must be maintained between the executive, management, and field operations ranks; between individuals and

¹ <http://abc7news.com/news/san-bruno-residents-remember-those-killed-in-pipeline-explosion/302058/>

² June 24, 2011, Report of the Independent Review Panel San Bruno, prepared for the California Public Utilities Commission.

³ *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011 (IRP Report) at 16

⁴ *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011 (IRP Report) at 16

their actions; between divisions and subdivisions; and between processes, functions, and overarching safety goals.⁵

On August 30, 2011, the NTSB issued its Accident Report investigating the San Bruno explosion and fire, which identified specific violations that led directly to that event. Many of those specific violations were also the subject of the Commission's San Bruno Investigations. The NTSB spoke of a deeper failure underlying the specific violations, which made the San Bruno event an "organizational accident."

C. SAFETY AND CULTURE

An organization's culture is the collective set of that organization's values, principles, beliefs, and norms, which are manifested in the planning, behaviors, and actions of all individuals leading and associated with the organization, and where the effectiveness of the culture is judged and measured by the organization's performance and results.

A strong safety culture requires commitment and accountability throughout an organization. A company's leadership and executive management must display a positive commitment to safety that is recognized throughout the organization. This commitment must be evident in the actions of management and the support they provide to the workforce. The organization must provide its people with the tools, resources, training and oversight necessary to ensure safe operations. Rules and requirements must be clear and consistent. Management must take a thoughtful approach to incidents and the implementation of new rules and standards. Employees should feel accountable for their own safety and the safety of their co-workers. They should feel comfortable stopping work during unsafe conditions or stepping in if they see another employee placing themselves, others or the public at risk. Employees should feel comfortable reporting potential hazards and incidents without fear of retribution as these can provide valuable lessons learned to improve safety practices. Disciplinary procedures should be consistently applied, recognizing the difference between human error, process defects, insufficient controls and a wanton disregard for safety rules.

As defined in the OII, a positive safety culture includes, among other things:⁶

- A clearly articulated set of principles and values with a clear expectation of full compliance.
- Effective communication and continuous education and testing. "Employees will do it right sometimes if they know how. They're more likely to do it right every time if they fully understand why."
- Uniform compliance by every individual in the organization, with effective safety metrics, recognition, and compensation, and consequences or accountability for deviating or performing at, above, or below the standard of compliance.
- Continuous reassessment of hazards and reevaluation of norms and practices.

⁵ I.15-08-019

⁶ I.15-08-09, pp 5-6

The success of a safety culture depends on *leadership* committed to making safety its first priority. This is particularly true in companies such as utilities where there are many layers of employees. The commitment to safety must extend to every employee and contractor of the organization, with consistent execution of the principles, values, and norms to foster a strong safety culture.

D. SCOPE AND OBJECTIVES

Previous analyses of PG&E's safety record and management focused on specific areas. The NTSB focused on PG&E's design, operation and maintenance of its gas transmission and distribution activities and policies.⁷ The IRP's central focus was PG&E's pipeline integrity management, but it expanded its scope to address such areas as emergency response and company culture.⁸

The objective of this safety culture investigation is to review the principles, values, qualities, factors, and metrics used to define, promote, and measure the effectiveness of PG&E's safety culture. In I.15-08-019, the Commission posed the following questions:

- Do PG&E's organizational failures cited by the NTSB continue?
- Does PG&E's progress suffer from impediments to process excellence within the control of the company?
- Is PG&E presently undergoing improvement with optimal risk management and strategic planning?
- Is PG&E designing accountability metrics and measures to achieve a high-functioning safety culture?
- Is PG&E realizing improvement with sufficient speed and deliberation?
- Why are the traditional tools of enforcement not working to prevent safety incidents and promote a high-functioning safety culture?
- Are the improvements PG&E has made (i.e., organizational changes) as widespread and deep as are necessary for a long-lasting and sustainable safety culture?
- What additional actions can the Commission order or promote to realize a high-functioning safety culture at PG&E?

NorthStar's review focused on the activities of Gas Operations, Electric T&D, Power Generation and Corporate Safety. Nuclear was not specifically a focus of this review; however, this review did consider best practices in the nuclear organization that could be transferred or adopted throughout the organization. Similarly, NorthStar's review did not focus on issues of environmental compliance and remediation or industrial hygiene. As

⁷ NTSB report

⁸ IRP report

stated by the Commission, NorthStar's investigation is not a duplicative review of enforcement actions concerning specific incidents already investigated or that are pending investigation at the Commission. This investigation instead conducts a deeper review of PG&E's and PG&E Corp.'s organizational culture, governance, and operations, and the systemic issues identified by the NTSB. According to the OII, the investigation should begin with what the Commission, customers, and the public should expect from PG&E when the State awarded PG&E its franchise and approved PG&E's rates. To answer this question, the investigation should examine PG&E's budgets, operational requirements, staffing, and approved revenue requirements and recorded spending in past years.

As NorthStar was not at PG&E prior to or immediately following San Bruno, it does not have first-hand knowledge of the safety culture and attitudes of the employees, management and the Board of Directors (Board or BOD) at that time. To assess changes in PG&E's safety culture, NorthStar relied on contemporaneous documentation (such as the IRP report, other consultant reviews and reports by external parties); policies, practices and procedures; trend information and other data regarding safety performance or priorities; meeting minutes and executive actions; interviews with personnel who have been in place since or prior to San Bruno; the impressions of individuals who were newer to the organization; and NorthStar's professional experience. NorthStar's assessment is largely based on PG&E's current safety culture.

PG&E has taken a number of steps following San Bruno to improve the safety of its infrastructure, the public and its employees. **Attachment 1** details some of the changes since San Bruno. PG&E made additional improvements during the course of NorthStar's investigation; however, more improvements are warranted. PG&E recognizes that there is additional work to be done, and that its focus on safety must never end. Culture change takes time and commitment. NorthStar's conclusions and recommendations are made with this intent — to assist PG&E and the CPUC in continuing to improve PG&E's safety culture.

At PG&E, the primary responsibility for safety rests with the various LOBs, in particular Gas Operation, Electric T&D, and Power Generation. Ultimately, responsibility rests with each employee to be accountable for his/her own safety and the safety of co-workers and the public. To achieve a unified culture at any large organization is challenging. Culture is driven by management commitment; the behavior and personality of an employee's immediate supervisors and co-workers; and, to a lesser extent by "corporate speak." The specific challenges and risks faced by gas operations, electric operations, other field operations and the various generating stations differ from each other and from those faced by corporate office workers. Maintenance and construction activities and associated risks differ between the LOBs. Hydro generation differs in many respects from fossil generation and from the risks associated with nuclear power. PG&E operates in a diverse, expansive service territory. Some of the facilities are remote, with minimal connection to the activities in downtown San Francisco. One should not expect precisely the same culture in each office, district or division. However, basic cultural tenets should be consistent throughout the organization.

PG&E made two significant changes in the early years following San Bruno to drive improvements in the safety culture: 1) the modification to its discipline policies and, 2) the emphasis on speaking up for safety.

In May 2012, PG&E developed a behavior-based approach to discipline, replacing its previous matrix-driven approach to determining the level of discipline for various safety infractions. Previously an employee may have been fired for a violation of safety rules or a safety incident. With the change in policy, discipline following safety incidents or accidents was to be used only as a last resort. In order to remove any perception of punitive action, PG&E began referring to the discussion between an employee involved in a safety incident and his/her supervisor, as a “Safety Discussion.”

Consistent with the change in the discipline policy, PG&E began encouraging management and employees to report safety issues and to have open dialogue regarding potential safety concerns. Ultimately this led to a number of initiatives. In February 2014, PG&E and the IBEW signed a Letter of Agreement related to the sharing and reporting of near hits (incidents where no property was damaged and no personal injury sustained, but where, given a slight shift in time or position, damage and/or injury easily could have occurred). According to the employee announcement: “This agreement reinforces PG&E’s commitment to foster a culture of trust an open dialogue in which near hits can be openly shared without the use of disciplinary action. This is a significant change from past practices and one we wholeheartedly believe is the right approach in order for us to build a safety-first culture.”⁹ PG&E also launched a training program to foster a more open environment in which employees would feel comfortable speaking up and placing safety first.

E. KEY CONCLUSIONS

Conclusions with broader organizational implications are highlighted in this chapter. Conclusions in all scope areas are detailed in the subsequent chapters of this report.

1. PG&E employees at all levels are committed to safety.

Throughout the course of the review, NorthStar was allowed unfettered access to PG&E personnel and executive management meetings and processes. This included attendance at Board committee meetings, executive management meetings and internal self-assessments. Employees were encouraged to be candid with NorthStar, and NorthStar believes for the most part that this occurred. PG&E immediately notified NorthStar in the event of a serious incident or a compliance violation which required self-reporting to the CPUC. Some of these may have ended up in fines. NorthStar believes this speaks positively to the issue of PG&E’s safety culture, its willingness to accept potentially negative findings and its desire to improve. NorthStar believes PG&E executive management is committed to safety. NorthStar observed a similar to commitment to safety among the field employees. No one desires to be unsafe.

⁹ DR 66 attachment 40

2. The dual-president model in place for most of NorthStar’s review, is not typical of the industry and does not promote the “One PG&E” focus. Regarding safety, PG&E continues to maintain a strong LOB, rather than enterprise-wide focus.

On August 17, 2015, following Chris Johns retirement as President of the utility, PG&E separated the roles of electric and gas operations, appointing Ms. Geisha Williams as President, Electric Operations and Mr. Nick Stavropoulos as President, Gas Operations. While this may have been beneficial from a succession planning standpoint, it was not consistent with a unified company focus.

On November 14, 2016, PG&E announced that the PG&E Corp. BOD had elected Ms. Williams as the Chief Executive Officer (CEO) and President of PG&E Corporation and Mr. Stavropoulos as President and Chief Operations Officer (COO) of the Utility, effective March 1, 2017. NorthStar is hopeful that the March 1, 2017, re-consolidation of the roles of president of the gas and electric businesses into a single utility president role will help foster a more consistent and inclusive approach to safety.

3. Corporate Safety’s organizational placement prior to March 1, 2017, did not send a strong message about PG&E’s commitment to safety. Additionally, the Lead Safety Officer in place until March 1, 2017, did not possess significant operational or safety credentials.

During the course of its review, NorthStar expressed concern that Corporate Safety was buried within the organization and was not led by individuals with strong safety credentials. The Safety organization and the Lead Safety Officer should have reported much higher in the organization, if for no reason other than to send a strong message about Executive Management’s commitment to safety. Until NorthStar’s review, Corporate Safety was part of the Safety and Shared Services (S&SS) organization which reported to Gas Operations. NorthStar recommended that this organization should report to the Utility President and be staffed with experienced safety personnel. NorthStar also expressed concern that the inclusion of the Environmental function within Safety and Health served to detract from the focus on public and employee safety. NorthStar recommended that the Lead Safety Officer also have a reporting relationship to the Nuclear, Operations and Safety (NOS) Committee of the Board, similar the relationship of an entity’s Internal Audit function to the Audit Committee of the Board.

For the most part this recommendation has been adopted. Following the return to a one-president structure in November 2016 (effective March 1, 2017), PG&E split Environmental from Safety and Health, and removed Safety and Health from the Shared Services organization, instead having it report to the President and COO of the utility with a reporting relationship to the NOS Committee. PG&E selected a new Vice President of Safety and Health with operational experience to serve as the Lead Safety Officer and hired an experienced Senior Director of Safety and Health.

4. Current safety culture efforts are disjointed and not part of a comprehensive, company-wide health and safety plan.

The need for a safety culture strategy was identified as early as 2010. PG&E changed its discipline policy, launched leadership training classes, and encouraged employees to “speak up,” but it did not develop a comprehensive strategy. Each of the LOBs has its own safety plan. Gas Operations has a Gas Safety Excellence Plan; Electric T&D created an Electric Operations Improvement Plan; and, Power Generation developed its own safety culture strategy. Corporate Safety manages the utility’s health and wellness programs and a number of cultural initiatives. Corporate Safety’s “plan” consists of six elements which shift and evolve based on timing and feasibility. The earliest iteration of Corporate Safety’s Safety Culture Roadmap is from mid-2014.

While each LOB implemented various programs and initiatives to improve safety, they were not part of a comprehensive corporate-wide plan, which encompasses all aspects of safety and which clearly defined the roles and responsibilities and inter-relationships between the LOBs and the Corporate Safety function. As a result, PG&E was slow in addressing some of the cultural issues. The lack of a comprehensive plan also creates the potential for differing messages and inconsistent communication. NorthStar believes PG&E felt considerable pressure to improve performance following San Bruno and launched a number of initiatives aimed at improving safety without sufficient consideration of the potential impact on the workforce or its ability to determine the effectiveness of individual campaigns.

5. Historically, the respective roles and responsibilities of corporate safety and the LOBs have been ill-defined. NorthStar believes the significant turnover in the Corporate Safety organization has also contributed to delays in addressing safety culture and the development of a holistic approach to safety.

6. PG&E has made positive strides in embedding a safety consciousness throughout the workforce; however, a cultural divide still exists between corporate and the field.

PG&E has made progress in improving its safety culture; however, the pace could be improved. The speed of change has been affected by internal blind spots, organizational issues and communication challenges. Management bandwidth issues may also play a role. Despite NorthStar’s concerns regarding the potential pace of change, there is a need in some areas to pause, recognize that change does not happen overnight, evaluate the effectiveness of initiatives currently underway and develop a comprehensive and robust plan for continuing to improve the safety culture throughout the organization.

7. PG&E has placed a heavy emphasis on training to improve safety performance and promote a positive safety culture. Many of these programs are good; however, the sequence and timing of training means crew foreman safety training may not be complete until 2019.

Since San Bruno, PG&E has delivered two enterprise-wide safety culture leadership training programs. The first program, conducted primarily in 2012 and 2013, was a one-day

Safety Leadership Workshop delivered to over 4,500 PG&E leaders from crew foremen to the CEO. It provided a good foundation for the development of an improved safety culture. The second safety culture leadership training program, the Safety Leadership Development Program, consisted of a series of six workshops delivered between 2014 and 2016. This workshop training should have positive impact on safety culture, but it was not given to crew foremen. PG&E plans to implement a safety training program for crew leaders in 2017, but the training will not be complete until the end of 2019.

8. There is insufficient company-wide communication regarding PG&E's safety culture strategy.

There is limited company-wide communication regarding PG&E's overall safety culture strategy. PG&E's primary approach to first communicating its post-San Bruno approach to safety was through the Safety Leadership Workshops in 2012 to 2014, and the leaders' follow-up discussions with employees. Although not part of a specific or unified campaign, the overarching message PG&E has been striving to instill in its workforce is that nothing is more important than safety and employees should "speak-up" where safety is concerned. PG&E has made significant strides in this area; however, this belief is not yet firmly and fully entrenched within the organization. The need to improve the "speak up" culture was identified in 2012 and 2014 surveys, but the PG&E did not implement a "Speak Up" campaign until fall 2016.

There are also indications that corrective actions related to incident investigations may not be shared with other LOBs on a timely basis or may be "lost" amongst the many other communications. PG&E recently replaced Electric T&D's Rapid Incident Notification System (RINS) with other systems. RINS gave Electric Supervisors a daily summary of safety incidents and outages from the previous day. It is too soon to predict the impact this may have on the field.

9. The Integrated Planning Process (IPP) has had a positive impact on the safety culture of PG&E since its introduction in 2012, but is not a replacement for a comprehensive integrated Utility Safety Plan.

The IPP involves a large number of employees on an almost continual basis throughout the year. Senior executives are a highly visible part of the process, indicating its importance. Each of the four sessions of the process requires employees and managers to consider and evaluate projects and initiatives that affect safety. Unfortunately, safety is not separated or differentiated from reliability and integrity. While reliability and integrity can often be linked to safety, they are not always the same thing as safety. Both PG&E and the CPUC are working to improve the focus on safety separate from reliability and integrity.

F. CRITICAL RECOMMENDATIONS

The following provides NorthStar's most critical recommendations for PG&E and the Commission.

- Development of an implementation plan for NorthStar's recommendations, to be submitted to the CPUC. PG&E should also provide periodic updates on its implementation status. This information shall be used by SED to ensure timely and effective implementation of NorthStar's recommendations.
- The need for clear definition of supervisory requirements, including an assessment of workload requirements, ongoing field monitoring efforts and time requirements, and associated staffing levels.
- Expedited completion of the safety leadership training for crew leads and foremen.
- Development of a comprehensive safety strategy, with associated timelines/deliverables, resource requirements and budgets, personnel qualifications, clear delineation of roles and responsibilities; action plans, assignment of responsibility for initiatives, and associated metrics to assess effectiveness. This should be followed with the identification of necessary corporate and LOB safety resource requirements and development of an appropriate organization structure. Also shared with SED
- Greater coordination among the LOBs and with Corporate Safety to increase consistency, improve efficiencies, minimize operational gaps, and facilitate sharing of best practices.
- Meaningful, consistent routine reporting of safety performance and metrics to the CPUC (all major California Investor-Owned Utilities (IOUs)).
- A non-punitive system for reporting actual and potential safety incidents to the CPUC to encourage reporting and facilitate lessons learned sharing among all California utilities. To the extent that the utilities are made aware of incidents or potential incidents in other states this information could also be shared.
- A Performance-Based Ratemaking (PBR) mechanism that includes a safety element to be considered in the rate design phase of the TY2017 PG&E General Rate Case (A. 15-09-011). The PBR mechanism should include a traditional rate of return component and a variable safety-related component based on pre-defined criteria and the discretion of the CPUC.

G. RECOMMENDATIONS FOR PG&E

Exhibit I-1 provides a summary list of the recommendations contained throughout the report. Additional detail on the recommendations is provided in the individual chapters. Exhibit I-1 provides NorthStar's assessment as to the priority of each recommendation (high, medium, low) and the potential cost/ease of implementation. Implementation is ranked using

an A, B, C scale, with A representing those initiatives that are relatively easy to implement and lower cost, and C representing those initiatives that are more difficult to implement or higher cost.

Exhibit I-1 Summary of Recommendations

A=Easy to implement/Low cost B= Harder to implement/Higher cost C=More difficult to implement or high cost				
Recommendation		Priority	Ease of Implem./ Cost	In Process?
Governance and Strategy				
III-1	Add safety to the list of qualifications used in selecting Independent Directors to the Board(s) of PG&E Corp. and PG&E. Periodically revisit the qualifications matrix and requirements for Independent Director as the industry and requirements change. Add Independent Directors to the Board who have experience with safety, perhaps in another industry such as aviation.	High	A	
III-2	Reassess and stabilize the safety culture change initiatives. The rigor applied to the integrated planning process (discussed in Chapter VI: Budgeting and Spending) should be applied to safety culture. The overwhelming number of initiatives and constant shifting of priorities is detrimental to a stable, consistent safety culture.	High	B	
III-3	Develop a comprehensive safety plan (by the end of 2017) that incorporates LOB and Corporate Safety activities to eliminate duplication, prevent gaps and appropriately prioritize expenditures. The plan should address culture, employee health and wellness, contractor safety, employee safety and public safety. Solicit input from throughout the organization, particularly the field, in the development of the plan. The environmental function was removed for the Safety, Health & Environment organization. It should have its own plan. The plan should be updated annually for at least two years and then at least every three years thereafter, with quarterly/annual monitoring of progress relative to the plan. The comprehensive plan should include all safety plans and programs of the Company, except for specific asset-related safety plans (such as asset management plans, leak survey programs or vegetation management) that should continue to be the responsibility of the various LOBs. The plan should be approved by the NOS Committee and the Boards, and endorsed and supported by executive management and the CPUC. The plan must be clearly communicated throughout the organization.	High	B	Plan in process. NorthStar does not know details of the plan or its comprehensiveness
III-4	Clearly define and articulate any new initiatives to improve safety culture. Perform cost-benefit analyses of these initiatives and identify performance measures. Corporate Safety recently produced an analysis of lost work days that might serve as a starting point for the thought process and analytics involved.	Medium	B	
III-5	Internal Audit should play a more active role in auditing safety controls, programs and processes.	High	A	
Organization				
IV-1	Appoint a Corporate Safety Officer who has both operations and professional safety experience. NorthStar is aware that Mr. Higgins replaced Mr. Bell as Corporate Safety Officer on March 1, 2017. While Mr. Higgins has operating experience with National Grid, PG&E and other utilities, he does not have professional safety training or experience. Mr. Higgins should undertake a professional training program that will provide him with the necessary skills as soon as possible.	High	A	New officer appointed
IV-2	The Corporate Safety Officer should report to the COO of the Utility and to the NOS Committee of the Board in the same manner that the head of Internal Audit reports to the Audit Committee of the Board in most public companies. (It is NorthStar's understanding that this has been implemented.)	High	A	Complete

A=Easy to implement/Low cost B= Harder to implement/Higher cost C=More difficult to implement or high cost				
Recommendation		Priority	Ease of Implem./ Cost	In Process?
IV-3	Examine workload levels, potential morale issues and other demands to understand and mitigate the reasons for the high turn-over at the Sr. Director, Safety and Health position and throughout the Corporate Safety organization.	High	B	
IV-4	Following the development of the safety strategy, review the structure, reporting relationships and staffing levels of the Corporate Safety organization to ensure PG&E has the resources necessary for strategy execution and proper coordination with/support for the LOBs.	High	B	
IV-5	Improve the safety credentials of personnel in PG&E's safety functions and organizations.	High	B	
IV-6	Simplify and clarify the roles and responsibilities of the Corporate Field Safety Specialists (FSS) vis-à-vis the LOB FSS to eliminate duplication, and align activities with the respective skill sets. Work with the LOBs to determine service levels and staffing requirements.	High	A	Portions in process
IV-7	Establish, and adhere to, minimum qualifications for Corporate and LOB FSS. Establish training requirements for LOB FSS to ensure they are up to date on current methods and procedures and have a working knowledge of key regulatory requirements.	Medium	B	
Field Operations				
V-1	Improve processes used to evaluate and translate best practices and techniques from one LOB organizational unit to others. Focus LOB FSS roles and responsibilities on integrating best practices among all LOBs, facilitating the implementation of corporate safety initiatives, and improving safety practices and awareness across all organizational units.	High	A	
V-2	NorthStar does not believe the FSS can be effective even in significantly great numbers given the geographic challenges associated with PG&E's service territory and the diverse job requirements. A more effective use of the FSS would be to have them focus on and support the first-line supervisors – foremen and crew leads.	High	A	
V-3	Perform a broad reassessment of all safety programs and initiatives to: evaluate overall effectiveness and make improvements, and eliminate scope overlap (e.g., the Corrective Action Program (CAP) vs. the Safety and Environmental Management System (SEMS) follow-up responsibility).	High	B	
V-4	Reevaluate staffing, roles, responsibilities and work requirements to increase Supervisor's time in the field supervising crews.	High	B	
V-5	Increase the training requirements for LOB FSS. Existing OSHA training is somewhat generic and not sufficiently related to PG&E's public and occupational hazards.	Medium	B	
V-6	Reevaluate the travel requirements placed on employees to reduce the overall mileage driven. Accelerate the use of mobile technology and electronic information exchange. PG&E employees drive a significant number of miles per year and are frequently called upon to support workload at great distances from their normal assigned locations.	Medium	A	
Budgeting and Spending				
VI-1	Develop a method of separating "safety" expenditures from routine reliability and integrity expenditures. This may occur as part of the CPUC's Risk Assessment Mitigation Phase (RAMP) process.	Medium	C	Addressed in RAMP. NorthStar does not know status
VI-2	Develop business case support and a record of management approval for safety initiatives in accordance with PG&E's Project Approval Procedure.	Low	A	
VI-3	Develop a method for weighting the value of management initiated safety programs comparable to the Risk Informed Budget Allocation	Medium	A	

A=Easy to implement/Low cost B= Harder to implement/Higher cost C=More difficult to implement or high cost				
Recommendation		Priority	Ease of Implem./ Cost	In Process?
	(RIBA) but focused on management and training.			
VI-4	Move forward with planned implementation of the Power Generation IPP Portfolio Planning and Management (PPM) system for all operational LOBs.	Medium	A	
VI-5	Continue efforts to better link IPP Session D to the Session 1 and 2 processes.	Low	B	In process
Compensation and Performance Management				
VII-1	None of the KPIs currently considered for use in measuring safety culture should be included as an incentive measure (i.e., included as part of the Short-Term Incentive Program (STIP) or the Long-Term Incentive Program (LTIP). This will only serve to provide artificially inflated results or drive unintended consequences. Most of the proposed metrics are based on either employee surveys or near hit/CAP reporting. Incentives tied to employee submittals will ensure targets are met and may minimize the value of the submittals (for example, a sudden influx of not particularly meaningful submittals prior to the end of a reporting period). Similarly, an incentive tied to survey results will drive positive reporting rather than true results,	Medium	A	
VII-2	Continue to track metrics eliminated from STIP as part of the Business Performance Review (BPR) process to allow trending.	Medium	A	
VII-3	Increase the weighting of safety in the LTIP to more closely align safety performance and executive compensation.	Medium	A	
VII-4	Reevaluate the appropriateness of the Earning from Operations component of the STIP due to its lack of transparency and the ongoing adjustments for Items Impacting Comparability.	Medium	A	
VII-5	Revisit all STIP metrics and targets in light of the enterprise-wide safety plan recommended by NorthStar. Set multi-year targets to drive performance. Include a contractor safety metric in the STIP. Following the development of the enterprise safety plan, PG&E should develop STIP and BPR metrics that measure plan implementation/ adoption and the effectiveness of the various initiatives identified in the plan. PG&E should continue monitor and report lagging OSHA metrics (i.e., DART, LWD, MVIs, fatalities) as part of the BPR process.	Medium	B	
VII-6	Develop a more robust and comprehensive set of BPR metrics addressing all aspects of safety such as public, employee and contractor safety; facility, infrastructure/asset and cyber security; environmental safety; public awareness; and, safety culture.	Medium	B	
VII-7	Improve the internal sharing of best practices. Increase the level of involvement by different groups and employee levels. As an example, NorthStar performed a management audit of National Grid Gas' New York operations a few years ago for the New York Public Service Commission. The utility had a fairly robust process improvement program. NorthStar's report describing the process is available on the New York State Department of Public Service's website.	High	B	
Training				
VIII-1	Accelerate crew foremen safety leadership training.	High	B	
VIII-2	Profile training participants so that individuals in office-based organizations generally do not receive field-oriented safety training ahead of field organizations.	Medium	A	
VIII-3	Complete the second 360-Degree Survey assessment for the Safety Leadership Development program participants and compare to the first assessment results to determine the effectiveness of the training and identify any gaps to be addressed.	Medium	B	
VIII-4	Conduct mandatory refresher training for Electric T&D, Gas Operations and Power Generation field resources on fundamental safety-related	Medium	B	

A=Easy to implement/Low cost B= Harder to implement/Higher cost C=More difficult to implement or high cost				
Recommendation		Priority	Ease of Implem./ Cost	In Process?
	topics such as confined space, safety at heights and personal protective equipment.			
VIII-5	Profile employees to receive Human Performance training.	Medium	A	Likely complete
VIII-6	Develop a monthly operator qualifications (OQ) status report for the Senior Vice President of Gas Operations and the President of Gas Operations. Include such information as number and type of examinations conducted, pass fail rates, number of qualifications expiring (in 90, 60, 30 and 5 days), the number of OQ scans conducted and the results.	Medium	A	
VIII-7	Conduct a review of 2014 OQs to determine if contract employees were working on PG&Es system with other expired OQs. Conduct additional re-inspections as necessary.	Medium	A	
VIII-8	Perform a feasibility study of PG&E training and testing of contractor employees for OQs. The study should consider the volume of students, the cost charged per unit, the availability of resources at PG&E and analysis of advantages and disadvantages.	Low	A	
VIII-9	Power Generation should continue to update its apprentice programs.	Medium	A	In process
VIII-10	Power Generation should work with the Academy to improve the timeliness of training completion.	Medium	A	In process
VIII-11	Power Generation should develop a refresher training program, similar to that of Electric T&D and Gas Operations.	Medium	B	
Communications				
IX-1	Develop and implement a strategic communications plan that does not overwhelm employees with too much information, but effectively addresses the issues identified in the January 2015 Monitor 360 Study, the 2016 Premier Survey (and PG&E's narrative analysis.)	High	B	
IX-2	Develop a consistent basis for measuring, tracking and trending employee attitudes regarding safety culture.	Medium	B	
IX-3	Develop and implement programs similar to Electric T&D's Reach Every Employee program in Power Generation and Gas Operations.	Medium	B	
IX-4	Assess the effectiveness of the 2016 Speak Up Culture campaign, particularly among field resources.	Medium	B	
Safety Reporting/Corrective Action				
X-1	Evaluate the adequacy of the information captured by various incident tracking systems (SEMS, CAP) to ensure it is sufficient to understand the causes of incidents, perform trending analyses and other analytics, and provide timely information. Improve CAP, near hit and incident tracking and reporting systems to increase the clarity of the information, ensure the appropriate level of causal evaluation has been assigned and that all required actions have been taken before an item is closed.	Medium	A – Evaluation B – Potential Changes	
X-2	Track the costs and relative safety benefits of the CAP and Near Hit Programs. Increase efficiencies or modify programs as warranted.	Medium	B	
X-3	Develop an evaluation program to maximize the benefits from CAP and Near Hit Reporting.	Medium	A	
X-4	Develop an evaluation program for Serious Incident Investigations to include periodic audits of the processes by Internal Audit.	Medium	A	
X-5	Improve documentation of corrective actions for incidents and near hits subject to a Work Group Evaluation (WGE), as well as for incidents subject to an Apparent Cause Evaluation (ACE) and Root Cause Evaluation (RCE).	Low	A	
X-6	Report and track incidents in a consistent manner such that appropriate information may be shared across the enterprise. Develop a central	Medium	B	

A=Easy to implement/Low cost B= Harder to implement/Higher cost C=More difficult to implement or high cost				
Recommendation		Priority	Ease of Implem./ Cost	In Process?
	repository for this information which should include an executive summary, corrective actions taken, any materials developed and the effectiveness evaluations.			
X-7	Develop a protocol involving concise, targeted, timely communications to notify other crews, work locations and LOBs of incidents or corrective actions that are applicable to that group.	Medium	B	
X-8	Develop a single, consistent enterprise causal evaluation standard combining Utility Standard: SAFE-1004S (Serious Investigation Standard) and the Enterprise Causal Evaluation Standard (Utility Standard: GOV-6102S). Incorporate the specified improvements.	Low	A	
X-9	Compare all LOB Causal Evaluation Standards to ensure the processes are consistent and all required elements are defined. As an example the Power Generation Procedure includes a discussion of the WGE process. Electric T&D and Gas Operations procedures do not. Gas Operations procedures do not include an RCE process timeline and appear to group RCE and ACE. The RCE communications plan for all procedures should include the communications process for follow-up on the Effectiveness Review Plan. Establish guidelines for communication of the corrective actions and the effectiveness reviews, as these are currently tracked separately by LOB.	Medium	A	
Contractor Safety				
XI-1	Corporate Contractor Safety should select the projects for review rather than the LOBs, and conduct “surprise” field visits to assess contractor safety practices.	Medium	A	
XI-2	Determine whether it is feasible to update the language in contracts to remove all references to the contractor or consultant being “solely responsible” for performing work in a safe manner.	Low	A	
XI-3	Develop formal criteria to close contractor serious safety incident action items in ISN.	Low	A	
XI-4	Facilitate the sharing of best practices and lessons learned regarding the LOBs’ implementation of the Contractor Safety Standard, addressing both organizational and procedural issues.	Medium	A	
XI-5	Update LOB contractor safety procedures to clarify responsibilities and reflect current organizations and processes. Include guidelines regarding the frequency of field observations.	Medium	B	
XI-6	Institute a contractor on-boarding test in Power Generation.	Low	B	

H. RECOMMENDATIONS FOR THE COMMISSION

NorthStar provides the following recommendations for consideration by the Commission.

1. Eliminate penalties for self-reporting of safety-related incidents by the California utilities; instead, implement a system that encourages reporting of actual and potential safety incidents to be shared among the utilities in order to identify best practices and share lessons learned. Actual incidents should be reported, as well as near hits. The CPUC should work with the California IOUs to define the parameters of near hit reporting. The system should be open to municipalities to encourage lessons learned sharing across the state.

2. Working with all California IOUs, develop a listing and consistent definitions of key safety-related metrics to be tracked on a monthly basis and reported to the CPUC at an agreed upon frequency. Performance reporting should be handled in a non-punitive manner, but subject to audit by the CPUC. On an annual basis, each utility's Internal Audit function should audit and render an opinion as to the accuracy of the information reported to the CPUC.
3. Consider the implementation of a performance-based ratemaking mechanism with a fixed component based on traditional ratemaking principles and a variable adder based on safety performance. Both components should have defined ranges. Safety performance can be defined in a variety of ways. As with any incentive mechanism, the potential for gaming is real. NorthStar's recommendations to PG&E, includes items that should provide a greater tie between safety performance and executive compensation.
 - NorthStar has recommended that PG&E reevaluate the appropriateness of the Earnings from Operations component of the STIP due to its lack of transparency and the ongoing adjustments for Items Impacting Comparability.
 - NorthStar recommends that PG&E increase the weighting of safety in the LTIP to more closely align safety performance and executive compensation. For a Named Executive Officer, the amount of compensation tied to safety performance through the STIP and LTIP is roughly eleven percent of the amount of total compensation awarded in a given year assuming stock prices remain at the assumed level and the Total Shareholder Return over the next three years is at target.
 - Increasing the proportion of LTIP meaningfully tied to safety-performance over a three-year horizon, may increase the tie between safety and compensation at the executive level. The design of this or a clawback mechanism would need to be carefully constructed to provide a reasonable likelihood of achieving the goal.
 - Consideration could also then be given to providing the Compensation Committee with similar authority over the granting of the safety portion of the LTIP – similar to the discretion it has over the STIP.
4. Perform periodic audits of the safety programs and culture of PG&E, and potentially the other major California investor-owned utilities.
5. Work planning and preparation has a significant impact on job safety. When utility work has an identified public safety impact, the CPUC needs a multi-agency hot line that PG&E (or other utilities) can call and request that the Commission contact the municipal permit department to encourage interagency collaboration and expedite work permits on an exception basis.

Attachment 1

Significant PG&E Safety-Related Accomplishments since San Bruno

As a result of NTSB and IRP analyses and the San Bruno incident, PG&E undertook a number of safety-related programs. The following list provides highlights of some of the significant changes. This list is not intended to be comprehensive. Additional initiatives, programs, and events are described throughout the Report.

- Improved its approach to budgeting and prioritizing work, implementing a risk-based integrated planning process.
- Consolidated Gas Operations under a Senior Vice President.
- Retrained its leaders to promote an open exchange of ideas rather than a command and control environment.
- Increased its emphasis on and improved its emergency response processes.
- Developed new training facilities and programs and required electrical workers to undergo a knowledge and skills assessment to ensure they are properly trained and can competently execute critical tasks.
- Added a risk propensity component to its hiring process for higher safety-risk positions.
- Updated its vehicles and replaced manual tools with tools designed to minimize employee injuries.
- Developed industrial athlete, ergonomic and stretching/dynamic warm-up programs to reduce the more minor, but common injuries. Repetitive activities when performed incorrectly can lead to long-term physical problems.
- Launched an extensive advertising and public education campaign addressing gas, electric, generation and dam safety.
- Opened a new gas control center.
- Implemented a stepped up program of in-line gas pipeline inspections. In addition to determining the condition of many miles of its system, PG&E identified areas that were not accessible to inline inspection. Some of these areas have been replaced to allow pigging. In addition, PG&E supported the development of new inline inspection tools capable of inspecting sections of pipe that previously could not be inspected.¹⁰
- Updated its records related to pipeline location and condition and revised procedures for maintenance of pipeline records.¹¹
- In May 2014, PG&E's Gas Operations organization achieved two international certifications recognizing best-in-class operational standards for asset management. PG&E's Gas Operations organization is one of the first utility organizations in the world to hold both the International Organization for Standardization (ISO 55001) and Publicly Available Specification (PAS 55) certifications. The certifications were awarded by Lloyd's Register.¹²
- In November 2015, PG&E obtained the American Petroleum Institute's (API) Recommended Practice (RP) 1173 Certification. API RP 1173 outlines specific best

¹⁰ DR 43 Attachment 002

¹¹ DR 043 Attachment 002

¹² DR 034

practices for safe and effective pipeline operations underpinned by a healthy safety culture.

- Closed-out 11 of the 12 NTSB Recommendations. The remaining NTSB recommendation is considered to have an “open-acceptable response”. **Exhibit II-1** provides the recommendations and reported closure date.

Exhibit III-1 **NTSB Recommendation Close-Outs**

Recommendation	Recommendation Description	Date Closed by NTSB
Traceable, Verifiable and Complete Records	This item reflects the comprehensive and exhaustive search we undertook for records held throughout the company in a variety of different locations and by numerous sources and departments.	NTSB Letter 3-13-2012
Emergency Procedure	A comprehensive response procedure to large-scale emergencies on the gas transmission lines was established. The procedure identifies a single person to assume command and specifies duties for all others involved. It includes the development and the use of troubleshooting protocols and checklists and requires periodic tests or drills to show that the procedure works.	NTSB Letter 8-29-2012
911 Notification	Gas control room operators, who monitor the transmission pipeline network 24/7, are now required to immediately and directly notify the respective 911 call centers when a possible pipeline rupture is detected.	NTSB Letter 8-29-2012
Toxicological Tests	PG&E revised its post-accident toxicological testing to ensure that it's timely and complete.	NTSB Letter 8-29-2012
Maximum Allowable Operating Pressure (MAOP) Validation	Use the traceable, verifiable, and complete records located to determine the valid MAOP based on the weakest section of the transmission pipeline or component.	NTSB Letter 3-14-2013
Hydrostatic Testing	If unable to determine MAOP for class 1, 3, 4 and class 2 HCAs, determine MAOP with a spike test followed by hydrostatic pressure test. (Closed-Acceptable Response)	Open-Acceptable Response NTSB Letter 12-1-2015
Work Clearance Procedures	Revise work clearance procedures. Identify the likelihood and consequence of failure associated with the planned work and develop contingency plans.	NTSB Letter 3-14-2013
SCADA System Tools to Locate Leaks/Breaks	Equip the SCADA system to assist in real-time recognizing and pinpointing leak location, line breaks, spaced flow and pressure transmitters along covered transmission lines.	NTSB Letter 5-15-2015
Automatic and Remote Shutoff Valves	Expedite the installation of automatic shutoff valves and remote control valves on transmission lines in high consequence areas	NTSB Letter 12-1-2015
Integrity Management Program	IMP assessment including revised risk, defect and leak data, risk methodology and improved self-assessment.	NTSB Letter 11-14-2013
Integrity Management (Threat Assessment)	Conduct threat assessments using the revised risk analysis methodology incorporated in the integrity management program, as recommended above.	NTSB Letter 11-14-2013
Public Awareness Program Continuous Improvement	Develop and incorporate written performance measurements, guidelines and continuous improvement in PG&E's public awareness program.	NTSB Letter 3-14-2013

Source: DR 853 Supplement 001, Attachments 001 – 006.

CHAPTER II: BACKGROUND

On August 27, 2015, the California Public Utilities Commission (CPUC or Commission) issued an investigation to determine whether Pacific Gas and Electric Company's (PG&E) and PG&E Corporation's (PG&E Corp.) organizational culture and governance prioritize safety and adequately direct resources to promote accountability and achieve safety goals and standards (I.15-08-019 *Order Instituting Investigation to Determine Whether PG&E and PG&E Corporation's Organizational Culture and Governance Prioritize Safety* (Safety Culture Investigation or OII)).¹ During the first phase of the proceeding, the Commission directed the Commission's Safety and Enforcement Division (SED) to evaluate PG&E's and PG&E Corp.'s organizational culture, governance, policies, practices, and accountability metrics in relation to PG&E's record of operations, including its record of safety incidents, and to produce a report on the issues and questions contained in the OII.

NorthStar Consulting Group, Inc. (NorthStar) was selected to perform the assessment. The review began in April 2016. Detailed fieldwork was conducted from May through December 2016. The initial draft report was scheduled for delivery to the CPUC on January 27, 2017. On December 30, 2016, PG&E provided NorthStar with a detailed "whitepaper" describing the safety-related activities that had been undertaken since San Bruno. In order for NorthStar to evaluate the information provided by PG&E, the draft due date was extended to March 17, 2017.

During the course of the investigation, NorthStar reviewed the responses to about 900 information requests and conducted more than 250 interviews. A number of those were field visits which would have resulted in discussions with more than one employee. NorthStar's activities are detailed later in this Chapter.

A. PACIFIC GAS AND ELECTRIC COMPANY

Incorporated in California in 1905, PG&E is one of the largest combined natural gas and electric energy companies in the United States, with \$63 billion in assets and \$17 billion in annual revenues.² Based in San Francisco, PG&E is the principal subsidiary of PG&E Corp. PG&E has about 5.4 million electric customer accounts and 4.3 million gas customer accounts.³

PG&E provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California. Its service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada mountains in the east. PG&E operates and maintains 141,215 circuit miles of electric distribution lines and 18,616 circuit miles of interconnected electric transmission lines; and, 42,141 miles of natural gas distribution pipelines and 6,438

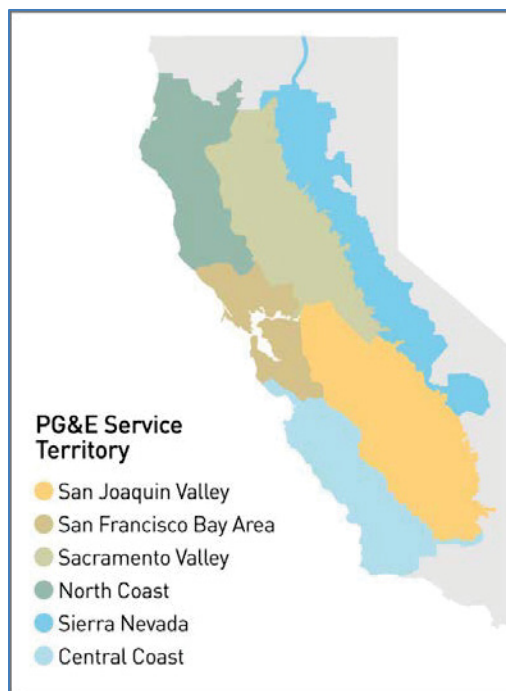
¹ <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M154/K291/154291675.PDF>

² www.pge.com, DR 004, Attachment 001

³ www.pge.com

miles of natural gas transportation pipelines.⁴ **Exhibit II-1** provides an overview of PG&E's service territory.

Exhibit II-1 PG&E's Service Territory



Source: DR 004, Attachment 001.

PG&E's generating assets include the Diablo Canyon Nuclear Power Plant (DCPP or Diablo Canyon), a hydroelectric system, three fossil fuel generating stations, and solar photovoltaic (PV) installations. PG&E's hydroelectric system is the largest investor-owned hydroelectric system in the nation.⁵

There are approximately 23,000 PG&E employees – about 14,000 of whom are covered by three collective bargaining agreements (CBA).⁶

- The International Brotherhood of Electrical Workers (IBEW) Local 1245 is PG&E's largest union. The IBEW accounts for just under 50 percent of PG&E's workforce. These employees provide:⁷
 - Maintenance and construction of PG&E assets
 - General construction, typically the replacement or building of new PG&E assets

⁴ www.pge.com

⁵ www.pge.com

⁶ DR 004 Attachment 001

⁷ DR 004 Attachment 006

- Operation of control centers for hydropower, gas, and electric transmission and distribution
 - Maintenance and restoration of gas and electric service to PG&E customers
 - Clerical functions related to the maintenance and construction of PG&E assets.
- Engineers and Scientists of California (ESC) Local 20 constitutes about 15 percent of the workforce. These individuals maintain and update PG&E system maps; estimate costs and design jobs prior to construction; provide engineering expertise; and, manage projects throughout the system.⁸
 - Service Employees International Union (SEIU) Local 20 provides security services at Diablo Canyon.⁹

Exhibit II-2 provides the workforce composition as of May 9, 2016. In addition to its 23,000 employees, PG&E uses a number of contractors and consultants for a variety of work activities.

Exhibit II-2
PG&E's Employee Count – May 9, 2016

Category	Number of Employees	Percent
Executive	48	0%
Management	7,789	32%
Technical	68	0%
Administrative	1,395	6%
Security	19	0%
Subtotal	9,319	38%
IBEW Clerical	2,383	10%
IBEW T200	6,252	26%
IBEW T300	2,475	10%
Total IBEW	11,110	
SEIU	235	1%
ESC	3,317	14%
Total	23,981	

Source: DR 002 Attachment 001 – CONFIDENTIAL.

PG&E field operations are performed by three primary lines of business (LOB) each reporting to a Senior Vice President (SVP) during the timeframe of NorthStar's review:

- Electric Transmission and Distribution (Electric T&D or ET&D). Until 2015, Electric T&D included Generation and was referred to as Electric Operations.
- Gas Operations.
- Generation (Nuclear, Hydro, Fossil and Solar).¹⁰ Power Generation is used throughout the report to refer to non-nuclear generation.

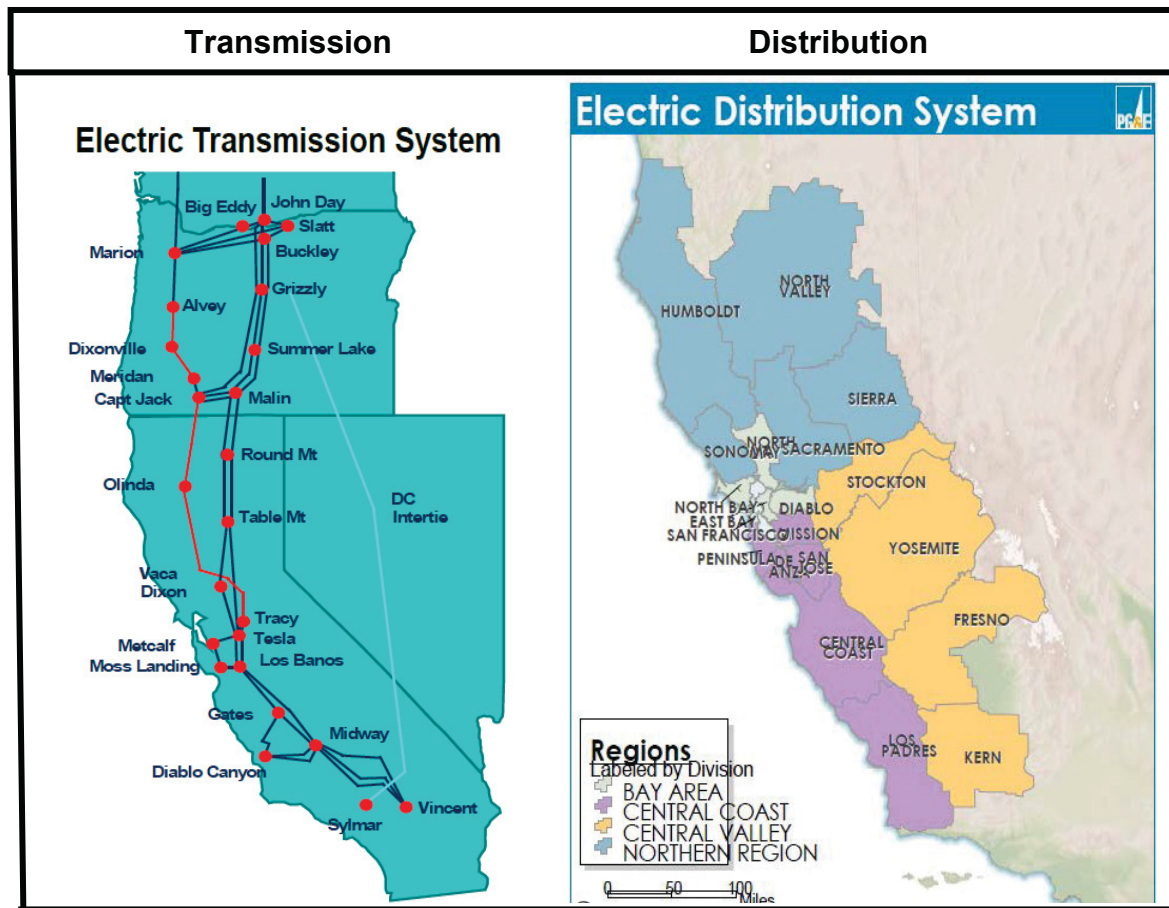
⁸ DR 004 Attachment 006

⁹ DR 004 Attachment 006

Electric Transmission and Distribution

PG&E's Electric T&D System serves 5.4 million customers over a 70,000 square mile service area. The system includes 907 substations, 3,100 feeders, over one million transformers and 2.6 million poles.¹¹ The Electric T&D system is illustrated in **Exhibit II-3**.

Exhibit II-3
PG&E's Electric System



Source: DR 004, Supplement 001, Attachment 002.

Electric T&D has 6,820 employees. Electric Transmission has a workforce of 1,867 performing line and substation design, maintenance and construction work. Electric Distribution has a workforce of 4,151 performing line design, maintenance and construction work. There are approximately 800 Electric T&D personnel who perform other work, including asset management, vegetation management, engineering, safety, training and quality support functions.

¹⁰ www.pge.com

¹¹ DR 004 Supplement 001, Attachment 002

The workforce is represented by the IBEW (3,687 employees) and ESC (1,672 employees); and, 215 administrative and technical personnel. The remaining resources, nearly 20 percent, are Management and Executive (1,246 employees).¹²

In general, Maintenance and Construction personnel are assigned to District Service Centers; while General Construction travel within the service territory to the construction work locations.

Gas Operations

PG&E's Gas Operations provide natural gas to over 4.4 million customer accounts. The system includes nearly 6,500 miles of transmission pipeline, 42,500 miles of distribution pipeline and 3.3 million services. Three gas storage fields, eight gas compressor stations, an LNG/CNG fleet and local fill stations deliver 970 billion cubic feet per year of natural gas.¹³ The Gas Operations System is depicted in **Exhibit II-4**.

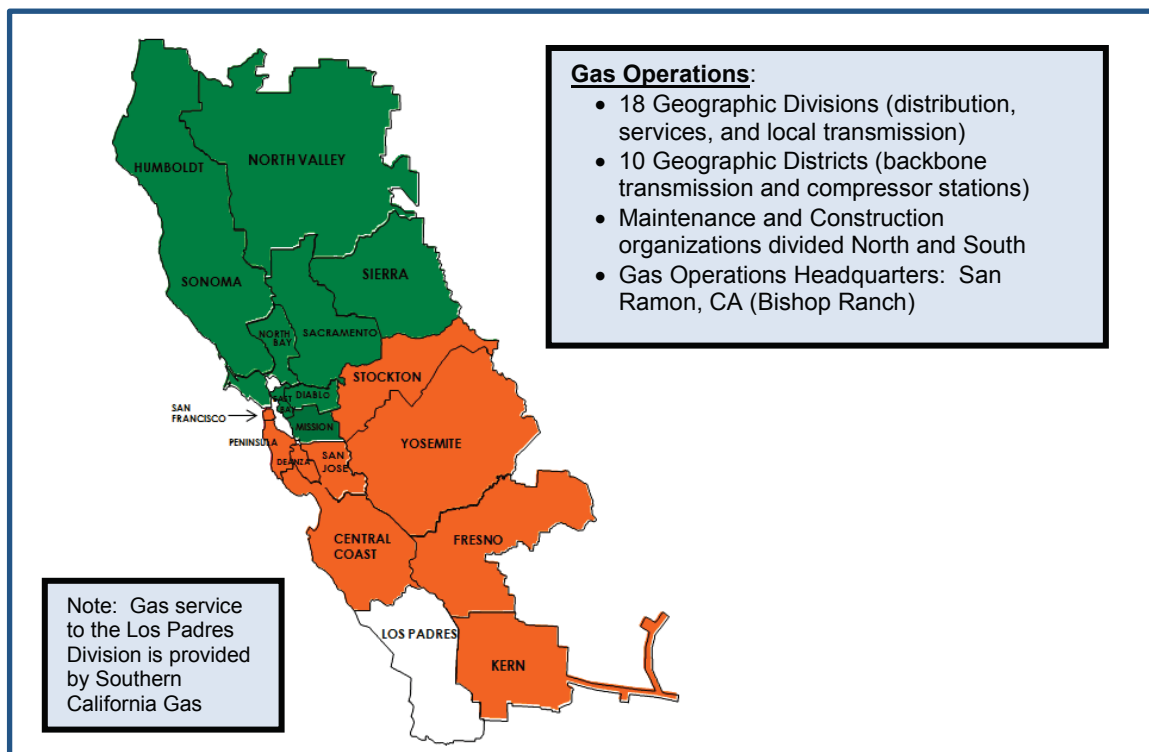
The Gas Operations workforce totals 5,630 employees. The majority of this workforce is represented by the IBEW – 3,290 employees performing gas pipeline construction, maintenance, operations, and field work. Gas estimators, designers, mappers, project management and other engineering functions comprise a workforce of 660 employees represented by ESC. Administrative and technical resources total 50, and management employees comprise the remaining 1,630 personnel in the organization.¹⁴

¹² DR 004, Supplement 001, Attachment 002

¹³ DR 004, Supplement 001, Attachment 003

¹⁴ DR 004, Supplement 001, Attachment 003

Exhibit II-4 PG&E Gas Service Divisions



Source: DR 004, Supplement 001, Attachment 003

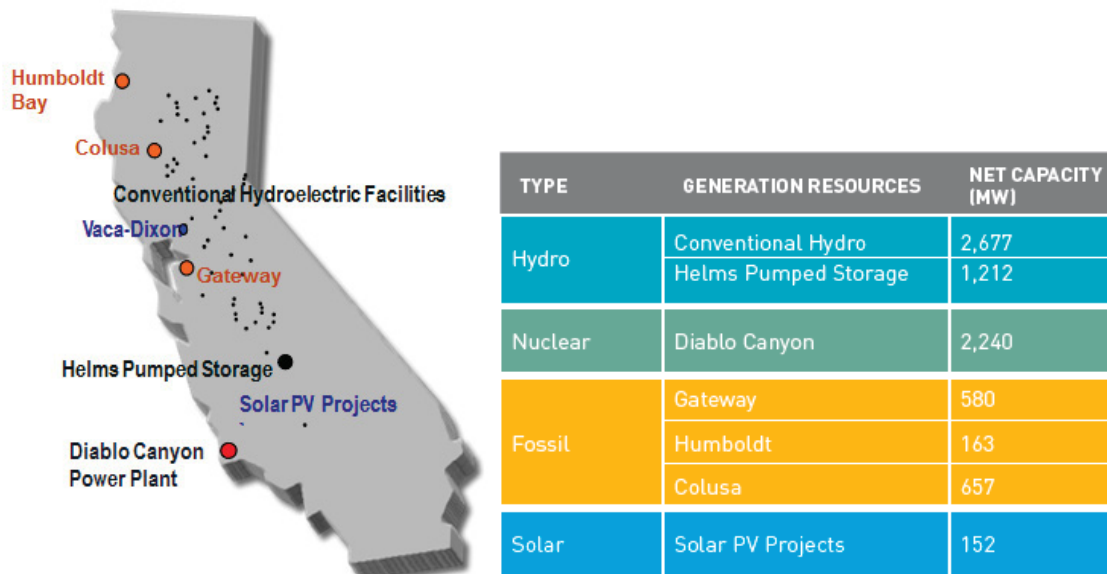
Generation

PG&E's Generation organization provides energy to the Electric T&D system and manages an extensive portfolio of generating assets illustrated in **Exhibit II-5**. Nuclear Generation (DCPP) and Power Generation combined employ a total workforce of 2,256 employees. DCPP alone represents 1,473 employees and from 100 to 1,850 contractor resources. Power Generation (non-nuclear) employs a work force of 783 and maintains a contractor work force of 100 to 350. The combined Generation workforce is represented by the IBEW (943 employees), 507 employees are represented by ESC and 236 employees are represented by SEIU.¹⁵ The remaining Generation employees are classified as leadership, professional and support resources (570 employees).¹⁶

¹⁵ DR 004, Supplemental 001, Attachment 005

¹⁶ DR 004, Supplemental 001, Attachment 005

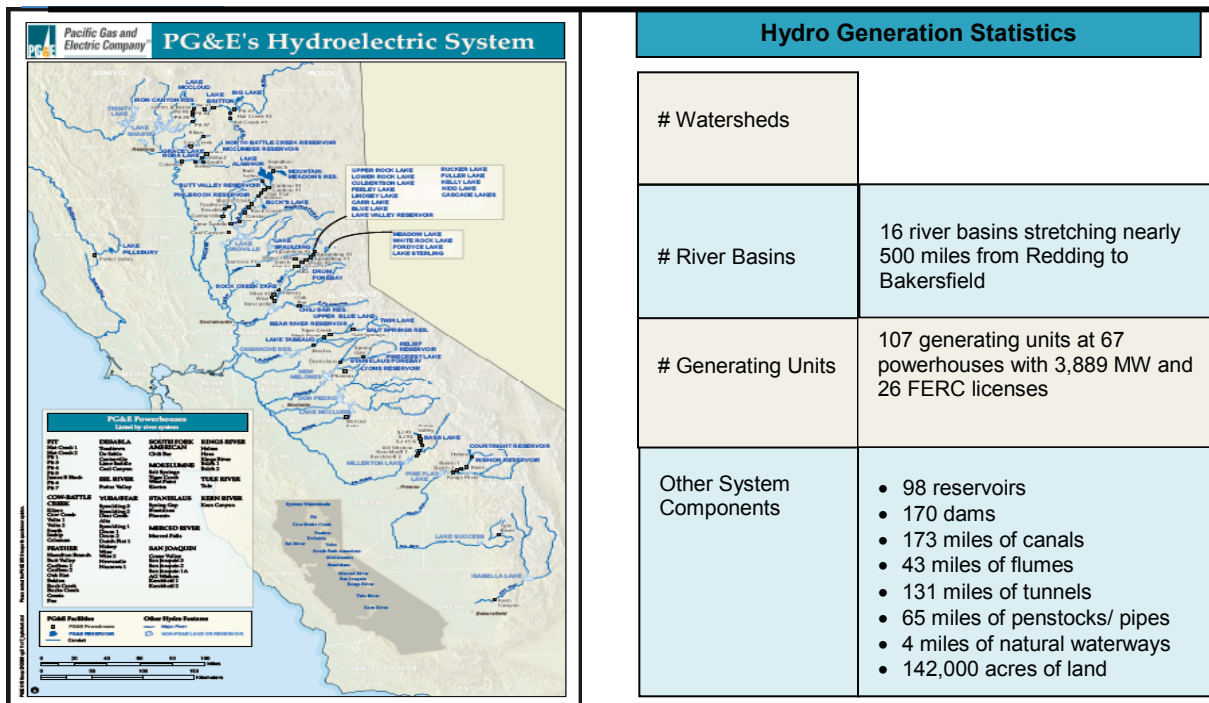
Exhibit II-5 PG&E Generations Assets



Source: DR 004, Supplemental 001, Attachment 005.

PG&E's Hydro Generation assets cover much of the State as depicted in **Exhibit II-6**.

Exhibit II-6 PG&E's Hydroelectric System



Source: DR 004, Supplemental 001, Attachment 005.

B. EVENTS LEADING TO THE INVESTIGATION

On September 9, 2010, at approximately 6:11 P.M., a portion of PG&E's 30-inch diameter underground natural gas transmission system (Line 132) suddenly ruptured. Operating at approximately 386 pounds per square inch gauge (psig), the pipeline was located under the asphalt paving at the intersection of Glenview Drive and Earl Avenue in a residential area of San Bruno, California. Installed in 1956, the 28-foot long section of Segment 180 Line 132 that failed consisted of five segments which were propelled into the air and landed about 100 feet away. An explosion ensued, fueled by blowing natural gas. The explosion and fire resulted in the loss of eight lives and the total destruction of 38 homes. Seventy homes sustained damage and eighteen homes adjacent to the destroyed dwellings were left uninhabitable.¹⁷

Safety matters associated with pipeline facilities are subject to state authority and an annual certification to the United States Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). After the San Bruno incident, the National Transportation Safety Board (NTSB), an independent agency with oversight over transportation accidents, immediately dispatched investigators to the scene of the incident. The NTSB undertook an investigation into the root cause(s) of the incident.¹⁸

On September 23, 2010, the CPUC approved Resolution No. L-403, which included the formation of an Independent Review Panel (IRP) of experts. The IRP's purpose was to gather and review facts and make recommendations to the CPUC for the improvement of the safe management of PG&E's natural gas transmission lines.

On June 24, 2011, the IRP issued its report, citing a "dysfunctional culture" at PG&E in which the goals of its enterprise risk management process were disconnected from the reality, decisions, and actions throughout the company. "... [PG&E] management made a faulty assumption. It did not make the connection among its high level goals, its enterprise risk management process and the work that was actually going on in the company." The IRP Report determined, "this failing is a product of the culture of the company – a culture whose rhetoric does not match its practices." This dysfunctional culture, the IRP Report concluded, appeared based on excessive levels of management, inconsistent presence of subject matter expertise in the management ranks, an appearance-led strategy setting, an insularity that impeded its ability to judge its effectiveness, and an overemphasis on financial performance. The IRP also cited a lack of "process excellence," which was explained as a failure of communication resulting from siloed, or segregated, business enterprises that should have, but failed to, communicate with each other. Importantly, the IRP indicates that PG&E's company culture failed to explain and acculturate the live link that must be maintained between the executive, management, and field operations ranks; between individuals and

¹⁷ June 24, 2011, Report of the Independent Review Panel San Bruno, prepared for the California Public Utilities Commission.

¹⁸ According to applicable regulations, an incident involves a release of gas from a pipeline and (1) a death, or personal injury necessitating in-patient hospitalization; or (2) estimated property damage, including cost of gas lost, of the operator or others, or both, of \$50,000 or more; or (3) an event that is significant, in the judgment of the operator, even though it did not meet the two previous criteria.

their actions; between divisions and subdivisions; and between processes, functions, and overarching safety goals.¹⁹

On August 30, 2011, the NTSB issued its Accident Report, citing specific violations that led directly to that event. Many of the cited violations were also the subject of the Commission's San Bruno Investigations. The NTSB spoke of a deeper failure underlying the specific violations, which made the San Bruno event an "organizational accident." The NTSB Report explained:

"Organizational accidents have multiple contributing causes, involve people at numerous levels within a company, and are characterized by a pervasive lack of proactive measures to ensure adoption and compliance with a safety culture. Moreover, organizational accidents are catastrophic events with substantial loss of life, property, and environment; they also require complex organizational changes in order to avoid them in the future."²⁰

As to PG&E, the NTSB concluded that the San Bruno explosion appeared to be an organizational accident. The NTSB emphasized that PG&E had been on notice of its violations through pipeline explosions that predated the 2010 explosion in San Bruno, and that PG&E, with such knowledge, could have taken proactive steps to correct the violations and prevent the devastating explosion in San Bruno.

"The character and quality of PG&E's operation, as revealed by this investigation, indicate that the San Bruno pipeline rupture was an organizational accident. PG&E did not effectively utilize its resources to define, implement, train, and test proactive management controls to ensure the operational and sustainable safety of its pipelines. Moreover, many of the organizational deficiencies were known to PG&E, as a result of the previous pipeline accidents in San Francisco in 1981, and in Rancho Cordova, California, in 2008. As a lesson from those accidents, PG&E should have critically examined all components of its pipeline installation to identify and manage the hazardous risks, as well as to prepare its emergency response procedures. If this recommended approach had been applied within the PG&E organization after the San Francisco and Rancho Cordova accidents, the San Bruno accident might have been prevented. Therefore, based on the circumstances of this accident, the NTSB concludes that the deficiencies identified during this investigation are indicative of an organizational accident."²¹

By 2015, the Commission had concluded its investigations into San Bruno, PG&E's gas transmission recordkeeping practices, and the operations and practices of its gas transmission

¹⁹ I.15-08-019

²⁰ <https://www.aga.org/federal-agency-reports-studies/national-transportation-safety-board-ntsb/ntsb-accident/ntsb-accident>

²¹ <https://www.aga.org/federal-agency-reports-studies/national-transportation-safety-board-ntsb/ntsb-accident/ntsb-accident>

pipeline system in locations of higher population density (collectively, the “San Bruno Investigations”).²² While the San Bruno Investigations were underway and PG&E faced the prospect of over \$1 billion in fines and penalties, PG&E publicly committed itself to improving the safety of its operations, investing in safety improvements, and reorganized its enterprise in order to prioritize safety. Nevertheless, accidents and events affecting the safety of its customers, the general public, workers and agents, the utility system and the environment continued to occur. In April 2015, the CPUC fined PG&E Corp. \$1.6 billion for the San Bruno event, reported to be the largest penalty ever levied against a utility in the state.²³

To date, PG&E has paid fines and penalties for certain safety violations; other incidents are pending investigation. A timeline of selected incidents is provided in **Exhibit II-7**.

Exhibit II-7
Timeline of Key Safety Events Leading to the Safety Culture Investigation
Does not include Safety-Related Employee Injuries

Date	Event
2008	Rancho Cordova Pipeline Accident
September 2010	San Bruno Pipeline Incident
June 2012	Kern Power Plant Contractor Fatality (tank dismantling)
April 2013	Metcalf Transmission Substation (gunman/gunmen struck transformers, equipment, and gas tanks with high-powered rifles, disrupting service at the Substation for nearly a month)
August 2013	Kern Power Plant Demolition Serious Injury to the Public
November 2013	SED cited and fined PG&E \$8.1 million for allowing a contractor to conduct radiographic pipeline tests that did not meet federal requirements
March 2014	House explosion in Carmel
August 2014	Metcalf Transmission Substation (perimeter breached in two locations and equipment stolen from the site)
November 2014	SED cited six separate incidents involving PG&E’s natural gas distribution lines, including the March 2014 house explosion in Carmel, when it initiated a formal investigation into PG&E’s gas distribution recordkeeping practices. [Note 1]
January 2015	PG&E conducted an “unsuccessful” in-line inspection of a high-pressure gas transmission pipeline, Line 147 in San Carlos. Further inspection revealed outward bulges in the pipeline, which required immediate removal of those pipeline sections
March 2015	West Park Substation, Bakersfield (two separate attacks in one night)
October 2013 – March 2015	SED issued five citations with fines under \$5 million each for safety code violations, lack of written Quality Assurance/Quality Control procedures for maintenance activities, failure to set a pipeline relief valve within the allowable pressure limit, and other violations

Note 1: Between January 2012 and November 2014, SED issued three citations with fines exceeding \$5M each (one citation exceeded \$10M) for failure to conduct pipeline leak surveys, non-standard pipeline testing, and the Carmel house explosion.

Note 2: According to SED, PG&E has had issues with its plastic fusion requalification procedures. Among other things, SED identified a gap in the way PG&E was requalifying employees on electro-fusion techniques.

Source: I. 15-08-019.

²² I.12-01-007, I.11-02-016, and I.11-11-009 (not consolidated)

²³ <https://www.wsj.com/articles/california-fines-pg-e-1-6-billion-for-deadly-gas-explosion-1428604317>

The persistence of safety incidents motivated the Commission to undertake I.15-08-019 to determine whether this persistence is rooted in PG&E's organizational culture and governance and to examine PG&E Corp.'s role in PG&E's safety culture. In its report, the IRP concluded: "[g]iven this Panel's findings regarding [PG&E's] gas transmission integrity management, one conclusion is inescapable. Simply put, 'the rubber did not meet the road' when it came to PG&E's implementation of the recommendations of its enterprise risk management process." The IRP lays this failure with PG&E's Board of Directors (BOD or Board) and executives and "the culture of the company – a culture whose rhetoric does not match its practices."²⁴

C. SAFETY AND CULTURE

As described in the OII, an organization's culture is the collective set of that organization's values, principles, beliefs, and norms, which are manifested in the planning, behaviors, and actions of all individuals leading and associated with the organization, and where the effectiveness of the culture is judged and measured by the organization's performance and results in the world (reality).

NorthStar believes that a strong safety culture requires commitment and accountability throughout an organization. A Company's leadership and executive management must display a positive commitment to safety that is recognized by all. This commitment must be evident in the actions of management and the support they provide to the workforce. The organization must provide its people with the tools, resources, training and oversight necessary to ensure safe operations. Rules and requirements must be clear and consistent. Management must take a thoughtful approach to incidents and the implementation of new rules and standards. Employees should feel accountable for their own safety and the safety of their co-workers. They should feel comfortable stopping work during unsafe conditions or stepping in if they see another employee placing themselves, others, or the public at risk. Employees should feel comfortable reporting potential hazards and incidents without fear of retribution as these can provide valuable lessons learned to improve safety practices. Disciplinary procedures should be consistently applied, recognizing the difference between human error, process defects, insufficient controls and a wanton disregard for safety rules.

According to the OII, positive safety culture includes, among other things:²⁵

- A clearly articulated set of principles and values with a clear expectation of full compliance.
- Effective communication and continuous education and testing. "Employees will do it right sometimes if they know how. They're more likely to do it right every time if they fully understand why."

²⁴ June 24, 2011, Report of the Independent Review Panel San Bruno, prepared for the California Public Utilities Commission and I. 15-08-019.

²⁵ <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M154/K291/154291675.PDF>.

- Uniform compliance by every individual in the organization, with effective safety metrics, recognition, and compensation, and consequences or accountability for deviating or performing at, above, or below the standard of compliance.
- Continuous reassessment of hazards and reevaluation of norms and practices.

The success of a safety culture depends on *leadership* committed to making safety first, particularly in companies such as utilities where there are many layers of employees, commitment by every employee and contractor of the organization, and consistent execution of the principles, values, and norms.²⁶

D. SCOPE AND OBJECTIVES

The objective of the safety culture investigation is to review the principles, values, qualities, factors, and metrics used to define, promote, and measure the effectiveness of PG&E's safety culture. In I.15-08-019, the Commission posed the following questions:

- Do PG&E's organizational failures cited by the NTSB continue?
- Does PG&E's progress suffer from impediments to process excellence within the control of the company?
- Is PG&E presently undergoing improvement with optimal risk management and strategic planning?
- Is PG&E designing accountability metrics and measures to achieve a high-functioning safety culture?
- Is PG&E realizing improvement with sufficient speed and deliberation?
- Why are the traditional tools of enforcement not working to prevent safety incidents and promote a high-functioning safety culture?
- Are the improvements PG&E has made (i.e., organizational changes) as widespread and deep as are necessary for a long-lasting and sustainable safety culture?
- What additional actions can the Commission order or promote to realize a high-functioning safety culture at PG&E?

According to the OII, the investigation is to evaluate PG&E's and PG&E Corp.'s governance, policies, practices, and safety metrics that have formed and continue to shape its safety culture and record of operation and performance. The investigation should also determine whether PG&E's organizational culture and governance are related to PG&E's

²⁶ OII, Martin, Greg. "The Need for Safety Culture in the Utilities Industry." *Utility Products*, Vol. 6, issue 3. <http://www.utilityproducts.com/articles/print/volume-6/issue-3/product-focus/safety/the-need-for-safety-culture-in-the-utilities-industry.html>

safety incidents and performance record, and if so, to what extent; and if so, how can or should the Commission order or encourage PG&E to develop, implement, and update as necessary, a safety culture of the highest order, so that PG&E's actions and performance record bear out that safety culture?

In D.12-04-010, issued in the Commission's rulemaking to revise the gas safety rules, the Commission emphasized the importance of "corporate leaders who are committed to safety as their first priority and who establish the priorities and values of a corporation, translate those priorities into a safety management system in its daily operations, and ... instill in the corporation's workers a commitment to safety through personal example and reward systems." Accordingly, the OII states that the safety culture investigation should analyze the methods that BODs and executive leadership use to hold themselves and management accountable for their decisions and actions, including executive compensation policies.²⁷

On May 30, 2016, following a series of interviews and presentations by PG&E personnel, NorthStar provided the CPUC with a detailed work plan for the conduct of the investigation. The work plan included:

- A "top-down" evaluation of PG&E Corp.'s and PG&E's safety culture, from both BODs and executives, to management, and through its company-wide operating and administrative units.
- Evaluation of the Companies' safety culture in setting safety goals, safety training, budgets, operational requirements, staffing, and priorities.
- Evaluation of the Companies' effectiveness of the overall management system in achieving the goal of safety.
- An evaluation of the enforcement tools available to the CPUC that have been, or would be, most effective in optimizing safety at PG&E.
- An evaluation of the adequacy and effectiveness of various PG&E programs that are important to an organizational structure that optimizes safety. These include the Companies':
 - Use of industry standards and best practices.
 - Quality control and quality assurance programs.
 - Use of internal and external audits.
 - Root cause analysis programs, methodologies, and post-incident policies and actions.
 - Confidential safety reporting systems.
 - Metrics used to assess safety culture and safety record, including metrics to assess long-term capital investments.

²⁷ I.15-08-019

- CPUC Staff involvement and knowledge transfer throughout the review to provide the Staff with the framework for future assessments.

The review was divided into eight scope areas, with recognition of the fact that there were overlaps and dependencies between the areas.

Scope Area 1: Strategy and Governance

Scope Area 2: Organization

Scope Area 3: Budgeting and Spending

Scope Area 4: Performance Management, Key Performance Indicators (KPIs) and Compensation

Scope Area 5: Safety Reporting/Corrective Action

Scope Area 6: Recruiting, Training and Coaching

Scope Area 7: Communications

Scope Area 8: Contractor Oversight

Scope Area 9: Field Operations

NorthStar's review focused on the activities of Gas Operations, Electric Operations, Power Generation and Corporate Safety. Nuclear was not specifically a focus of this review; however, the review did consider best practices in the nuclear organization that could be transferred or adopted throughout the organization. Similarly, NorthStar's review did not focus on issues of environmental compliance and remediation or industrial hygiene. The CPUC has jurisdiction over the rates and terms and conditions of service for the Utility's electricity and natural gas distribution operations, electricity generation, and natural gas transmission and storage services. The CPUC enforces state laws and regulations that set forth safety requirements pertaining to the design, construction, testing, operation, and maintenance of utility gas and electric facilities.²⁸ The Nuclear Regulatory Commission (NRC) oversees the licensing, construction, operation and decommissioning of nuclear facilities, including the two nuclear generating units at Diablo Canyon and PG&E's retired nuclear generating unit at Humboldt Bay. NRC regulations require extensive monitoring and review of the safety, radiological, seismic, environmental, and security aspects of these facilities. In the event of non-compliance, the NRC has the authority to impose fines or to force a shutdown of a nuclear plant, or both.²⁹

As stated by the Commission, NorthStar's investigation is not a duplicative review of enforcement actions concerning specific incidents already investigated or that are pending investigation at the Commission. Instead, this investigation conducts a deeper review of PG&E's and PG&E Corp's organizational culture, governance, and operations, and the systemic issues identified by the NTSB. According to the OII, the investigation should begin with what the Commission, customers, and the public should expect from PG&E when the

²⁸ PGE Corp. 2015 Annual Report

²⁹ PGE Corp. 2015 Annual Report

State awarded PG&E its franchise and approved PG&E's rates. To answer this question, the investigation should examine PG&E's budgets, operational requirements, staffing, and approved revenue requirements and recorded spending in past years.

NorthStar conducted detailed fieldwork from May to December 2016. On December 30, 2016, PG&E provided NorthStar with a detailed "whitepaper" describing the safety-related activities that had been undertaken since San Bruno. A draft report was provided to the Commission on March 23, 2017. A number of organizational changes and other events took place towards the end of or after the completion of NorthStar's fieldwork. These include:

- On October 27, 2016, in an email from the Presidents of Electric and Gas to all PG&E employees titled "Taking Action on Affordability and Competitiveness" PG&E announced a series of steps designed to achieve efficiencies that would reduce PG&E's costs by \$300 million. These steps included: revising contract terms with vendors; reducing expenditures on travel and on IT and telecommunications devices; not filling some open positions; and, re-evaluating the use of non-employee workers.³⁰
- On November 14, 2016, PG&E announced that the PG&E Corp. BOD had elected Ms. Geisha Williams as the Chief Executive Officer (CEO) and President of PG&E Corp. and Mr. Nicholas (Nick) Stavropoulos as President and Chief Operations Officer (COO) of the Utility, effective March 1, 2017, thus consolidating the separate roles of president for the gas and electric businesses into a single utility president role. The roles were separated in 2015. Mr. Anthony (Tony) Earley, Jr., currently Chairman, CEO and President of PG&E Corp., was elected to serve as Executive Chair of the PG&E Corporation BOD.³¹
- On January 11, 2017, PG&E Corp. and PG&E announced new, streamlined management structures and a series of efficiency measures designed to support the company's ability to continue to modernize and invest in the safety of its electric and gas systems while ensuring that its services remain affordable for customers. PG&E plans to reduce the number of officers by 15 percent, or eight positions, resulting in a flatter, more nimble, decision-making structure.³² The organizational changes affected the Corporate Safety organization.
- On January 26, 2017, pursuant to 18 U.S.C. § 3563(b)(22), in Case No. CR-14-00175-THE, an independent third-party monitor was ordered to help ensure PG&E takes reasonable steps to maintain the safety of the gas transmission pipeline system, performs appropriate assessment testing on gas transmission pipelines, and maintains

³⁰ October 27, 2017 email from Geisha Williams and Nick Stavropoulos to all PG&E and PG&E Corp. employees forwarded to NorthStar

³¹ https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20161114_williams_elected_ceo_and_president_of_pge_corporation_as_part_of_leadership_succession_plan

³² https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20170111_pge_streamlining_management_implementing_efficiency_measures_to_keep_customer_bills_affordable_while_investing_in_the_future

an effective ethics and compliance program and safety-related incentive program. The independent monitor will be in place for no less than three, but up to five, years. The independent monitor's work was not scheduled to commence before the completion of NorthStar's report.³³

- Lower-level organizational changes are planned for March 2017.

To the extent NorthStar has knowledge of the above events they are mentioned in this report; however, the timing of the changes did not necessarily allow for detailed review.

E. WORK ACTIVITIES

During the conduct of the review, NorthStar performed the following activities:

- Received seventeen orientation presentations over five days: two days of corporate presentations in April 2016, and three days of LOB presentations in May 2016.
- Conducted site visits to Diablo Canyon; the San Ramon, Tracy, and Livermore Training Centers; the Gas Control Center; Feather River power houses and control centers; Clayton Fire Base Camp (Lower Lake); and, nineteen field offices (San Francisco, Daly City, Oakland, Hayward, Sonoma, Chico, San Luis Obispo, Santa Maria, Pismo Beach, Fresno, Auburn, King City, Monterey, Salinas, Antioch, Manteca, Stockton, Needles, and Hinkley). During these site visits NorthStar observed meetings and daily work activities (office and field) and conducted interviews with supervisors, crew leads and work crews.
- Performed field site visits and observations of both PG&E and contractor crews performing generation, electric and gas work – transmission, distribution, substations – maintenance and construction (M&C), general construction (GC) and vegetation management. Visits included interviews with crew members, supervisors, grass roots personnel and safety specialists (field and LOB).
- Attended field visits performed by the SVP, Gas Operations and the SVP, Electric Operations.
- Conducted ride-alongs with electric troubleshooters and gas leak emergency responders.
- Attended select training classes, including new employee orientation training.
- Obtained demonstrations of the various safety reporting and incident tracking systems and databases.

³³ <https://www.justice.gov/usao-ndca/press-release/file/932806/download>

- Conducted over two hundred and fifty interviews with:
 - Executive Management
 - The BOD (11 Members including all Committee Chairs)
 - All three unions (IBEW, ESC and SEIU)
 - Significant PG&E safety program contractors
 - PG&E management and operations personnel within the LOBs
 - Safety and Shared Services (S&SS) personnel
 - Departing and former employees
 - Contractor personnel (during site visits and meeting).
- Attended various operations, safety-related and governance committee meetings including the:
 - Enterprise People Committee
 - Enterprise Safety and Risk Committee
 - Electric Safety Council
 - Gas Safety Council
 - Gas Operations Risk and Compliance Committee
 - Annual Safety Summit for Officers and Directors
 - Daily Gas Operations Call
 - Gas Operations Quality and Process Improvement Committee
 - Gas Operations Notification Review Team Daily Meeting related to the Corrective Action Program
- Attend BOD Finance, Compensation and Nuclear Operations and Safety Committee meetings.
- Reviewed and assessed PG&E's whitepaper *PG&E's Safety Journey: 2010-2017 and Beyond*.
- Reviewed the responses to almost 900 information requests.

F. ORGANIZATION OF THIS REPORT

The remainder of this report is organized as follows.

Chapter

- I. Executive Summary
- II. Background (this Chapter)
- III. Strategy and Governance
- IV. Organization
- V. Field Operations
- VI. Budgeting and Spending

VII. Compensation and Performance Management

VIII: Recruiting and Training

IX: Communications

X. Safety Reporting/Corrective Action

XI. Contractor Safety

Appendix A Acronyms and Abbreviations

Appendix B Incident Reporting Systems

CHAPTER III: STRATEGY AND GOVERNANCE

This chapter provides the results of NorthStar’s review of the role of PG&E executive management and the BODs in promoting a strong safety culture and developing PG&E’s overall safety strategy. NorthStar reviewed PG&E’s strategy for improving its safety culture, assessed executive management’s and the Boards’ commitment to employee and public safety, and evaluated whether governance processes are supportive of long-term cultural change.

The San Bruno IRP found that PG&E “did not make the connection between its high level goals, its enterprise risk management process, and the work that was actually going on in the company.”¹ The IRP attributed this failing to, “the culture of the company – a culture whose rhetoric does not match its practices.”² The IRP report on the explosion found that, “[g]iven this Panel’s findings regarding [PG&E’s] gas transmission integrity management, one conclusion is inescapable. Simply put, ‘the rubber did not meet the road’ when it came to PG&E’s implementation of the recommendations of its enterprise risk management process.”³

A. BACKGROUND

Governance

Governance refers to the system of rules, practices and processes by which a company is directed and controlled. Corporate governance essentially involves balancing the interests of the many stakeholders in a company - its shareholders, management, employees, customers, suppliers, financiers, government and the community. It provides the framework for achievement of a company’s objectives. Effective executive management and governance structures and processes have the following attributes:

- An experienced, knowledgeable and involved Board with appropriate committees providing effective oversight and direction.
- Top management with the right number of people with the right skills.
- A proper organizational focus and direction supported by effective corporate planning.
- Effective means of communications among executives on important business, legal, regulatory, cost and performance issues.

For public companies, the Board provides overall guidance, direction and oversight of the management of the company, and impartial review of management decisions. The value of a

¹ *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011 (IRP Report) at 16

² *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011 (IRP Report) at 16

³ *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011 (IRP Report) at 15-16.

Board can also be strengthened by the presence of Independent Directors not associated with the company. Independent Directors provide an outside view of the company and can add business perspective and offer suggestions from other industries.

PG&E Corp. is a holding company whose primary operating subsidiary is PG&E, a public utility operating in northern and central California. PG&E Corp. became the holding company of the Utility and its subsidiaries in 1997.⁴ PG&E and PG&E Corp. are each governed by largely overlapping BODs. All members of the Board are elected annually and serve one-year terms.

Pre-San Bruno Board of Directors

In 2009, there were ten non-employee Directors, and two employee Directors on the PG&E Board.⁵ The PG&E Corp. Board consisted of the ten non-employee Directors and one employee Director. The standing Board Committees included the following:

- Audit Committee (one each PG&E and PG&E Corp.)
- Compensation Committee
- Finance Committee
- Nominating and Governance Committee
- Public Policy Committee
- Executive Committee (one each PG&E and PG&E Corp.).

At the time of the San Bruno explosion in 2010, the Boards' Audit Committees were responsible for safety-related issues. According to PG&E, the Audit Committees "were actively involved in and responsible for assisting the Boards in overseeing safety risk through those Committees' review and discussion of: (1) quarterly internal auditing results and internal audits involving safety risk issues, (2) operational audits by the California Public Utilities Commission and other regulatory agencies, (3) specific operational and safety issues, such as alleged deficiencies in the Utility's inspection and maintenance practices with regard to gas distribution facilities, and (4) the guidelines and policies that govern the processes by which major risks are assessed and managed. The Audit Committees also were actively involved in and responsible for assisting the Boards in overseeing the implementation and effectiveness of the Companies' legal compliance and ethics program, through those Committees' review of program design and effectiveness in PG&E as a whole as well as in specific lines of business."⁶

The PG&E Corp. Board's Finance Committee was also actively involved in, and responsible for, assisting the Boards' in their oversight of safety risk through its review of strategies to manage the largest individual risks identified in the enterprise risk management

⁴ 2015 Annual Report

⁵ One of the eleven independent directors retired on May 13, 2009; Chris P. Johns the Utility President was a member of the Utility Executive Committee only.

⁶ DR 615

program (e.g., wildfire, Diablo Canyon Power Plant shutdown, system safety, business continuity, and environmental).⁷

Post-San Bruno

A timeline of key governance/organizational changes and safety events is provided in **Exhibit III-1**.

The incident at San Bruno occurred on September 9, 2010. Mr. Darbee, who had been CEO and President of PG&E Corp. since 2005, resigned effective April 30, 2011. The Chairman of the Board of the Utility was Mr. C. Lee Cox, who was the independent lead director of both the PG&E and PG&E Corp. Boards.⁸ Mr. Christopher P. Johns was President of PG&E. He served in this capacity from August 2009 to August 2015.⁹

Mr. Cox served as Chairman, CEO and President of PG&E Corp. until Mr. Anthony (Tony) Earley was elected to those positions effective September 13, 2011. According to PG&E's proxy statement, as "a subsidiary of PG&E Corporation, the Utility also benefits from Mr. Earley's position as Chairman and CEO of the Corporation. Mr. Earley, however, may not serve in either of these capacities at the Utility. In conformance with certain rules of the CPUC, the same individual may not serve as Chairman of the Board, CEO, or President, or in a functionally equivalent position, of both the Corporation and the Utility."¹⁰

As of December 31, 2016, the Utility Board has 15 members — twelve of whom are independent. The PG&E Corp. Board comprises 13 members including the same twelve independent members as the utility Board. The Presidents of Electric and Gas Operations serve on the Utility Board only. The Boards meet concurrently unless there are matters that involve only PG&E Corp.

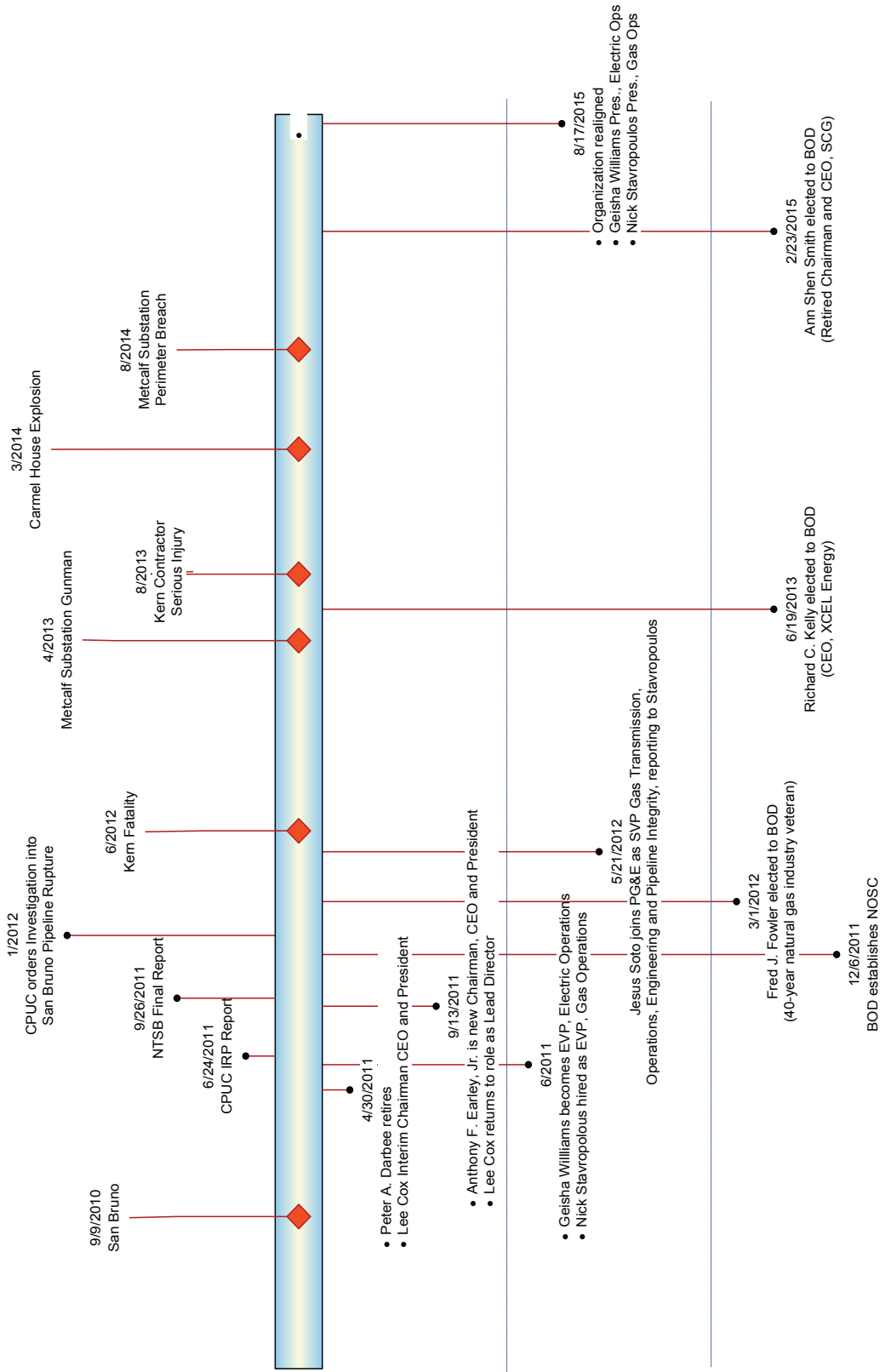
⁷ DR 615

⁸ March 31, 2010 Proxy Statement.

⁹ www.pgecorp.com

¹⁰ May 23, 2016 Proxy Statement

Exhibit III-1
Timeline of Key Safety and Governance Events



Source: DR 009, DR 010, PG&E News Releases, I.12-01-007 CPUC Investigation into the San Bruno Gas Pipeline Rupture.



B. EVALUATIVE CRITERIA

- Is the role of the Companies' Boards of Directors and Executive and Senior Management in the development of safety policies and accountability appropriate? What priority is given to safety in these processes?
- Overall, do the Boards exercise a suitable level of authority and responsibility?
- Does the Board properly represent and address the interests of all customers and ratepayers in its monitoring of the organization, occupational and public safety?
- Are governance processes appropriate, particularly as they relate to the development and continued support of a safety culture?
- Is the definition of "safety culture" similar throughout the various organizations or are there significant differences?
- Does PG&E have an actual strategy for safety cultural change and is it documented? Has the approved strategy been communicated throughout the organization? Or is the strategy a "strategy by default"?
- Do management, the Board and its committees appropriately prioritize their attention between different business units? (electric/gas/generation)

C. FINDINGS AND CONCLUSIONS

1. Executive Management has a strong commitment to safety. PG&E routinely expressed a willingness to learn from this review and an openness to potential criticism. PG&E provided NorthStar with access to executive level meetings where employees, management and Board members spoke freely about safety issues and the Utility's progress in improving safety consciousness.

- NorthStar was allowed to attend enterprise committee meetings, LOB meetings, Board committee meetings, training classes, new employee orientation, and other meetings. NorthStar was privy to major announcements and listened in on selected all employee calls.
- NorthStar interacted freely with field employees. Employees were told to be honest and forthcoming with NorthStar. Interviews conducted in the field evidenced this candor.
- Officers and Directors were generally candid, and willing to point out strengths and opportunities for improvement.
- NorthStar's interactions with PG&E management and staff confirmed management and employee commitment to safety.
- Many of the interviewees (employee and management) were passionate about safety during discussions.
- During the course of the review, PG&E self-reported a number of compliance issues to the CPUC, understanding that the reporting would likely result in fines.

- NorthStar attended the Second Annual Safety Summit for Officers and Directors and observed a genuine commitment to safety.
 - Attendees were asked to complete self-assessment forms before the meetings, reflecting on the safety culture in their immediate organization, their personal safety leadership, and their line-of-sight to frontline safety. The results were shared at the start of the meeting, and indicated that improvement was still warranted.
 - The meeting also demonstrated that the “speak up culture” PG&E is trying to instill in the organization is not yet deeply entrenched in the upper ranks of the organization who have had the most exposure to training in this area. As an example, some Directors were somewhat reticent to speak up during the question and answer sessions.
 - NorthStar was impressed with the ability of the corporate functions to connect their activities to the safety of employees and the public – the link between some corporate functions (e.g., supply chain, Information Technology (IT) or tax) and safety is not always readily apparent.¹¹

2. The Board was made aware of issues relating to gas distribution safety a number of times preceding the San Bruno explosion.

- Several employees raised gas distribution system safety issues at the 2007 annual meeting of shareholders.¹²
- In the March 2008, Audit Committee meeting, then CEO Mr. Peter A. Darbee, provided an overview of the status of the leak re-survey of the North Bay and North Coast Division gas systems, preliminary findings and actions taken. He recommended initiating an independent investigation into the maintenance of the Utility’s gas distribution system. The Committee used outside counsel to conduct the independent investigation.¹³
- In August 2008, the Audit Committee requested that Management make a study of comparative metrics for natural gas safety, reliability, and asset efficiency. Management reported results at the February 17, 2009, meeting of the Audit Committee. As part of this discussion they determined that benchmarking and differences/difficulties prevented any conclusions.¹⁴

¹¹ IR 185 and packet provided at the meeting.

¹² DR 006 – CONFIDENTIAL Board minutes

¹³ DR 006 – CONFIDENTIAL Audit Committee minutes, March 28, 2008.

¹⁴ DR 006 – CONFIDENTIAL Audit Committee minutes

3. Despite the significance of San Bruno and the IRP findings, there were no major changes to the composition of the Independent Directors of the BODs. It was not until 2012, that the BOD added additional utility operational expertise, and its safety expertise remains limited.

- As shown in **Exhibit III-2**, there were no immediate changes to the composition of the BODs as a result of San Bruno. Of the ten Independent Directors in place prior to San Bruno, eight still remain on the BODs as of December 2016. Of the two that departed: one remained until shortly before his death in 2013, and the other remained until he reached his mandatory retirement age in 2014.
- Three Independent Directors were added to the board prior to NorthStar's review: Fred J. Fowler (2012), Richard C. Kelly (2013) and Anne Shen Smith (2015).
- All of these directors have prior experience in the utility industry. Anne Shen Smith held the position of Vice President of Environment and Safety for Southern California Gas Company.¹⁵
- Another Board member was added in September 2016.
- During interviews with NorthStar, the newer Board members indicated that an expectation of a strong safety performance record was a pre-requisite for their selection.¹⁶ However, NorthStar does not know the extent to which this influenced actual selection of Board members.

Exhibit III-2
PG&E Corp. and PG&E BOD Composition

Board Member	Background	Date First Joined	Year							
			09	10	11	12	13	14	15	16
PG&E Officers										
Peter A. Darbee	President PG&E Corp and PG&E Left 4/2011	2005								
Christopher P. Johns	President, PG&E until 8/2015 Left BOD 12/2015	8/2009								
Anthony F. Earley, Jr.	Chairman, CEO and President of PG&E Corp.	9/2011-Corp. 6//2012-PG&E								
Geisha Williams	President, Electric PG&E	8/2015 PG&E only								
Nick Stavropoulos	President, Gas PG&E	8/2015 PG&E only								

¹⁵ http://s1.q4cdn.com/880135780/files/doc_financials/2016/2016-Proxy-Statement-Final.pdf page 18

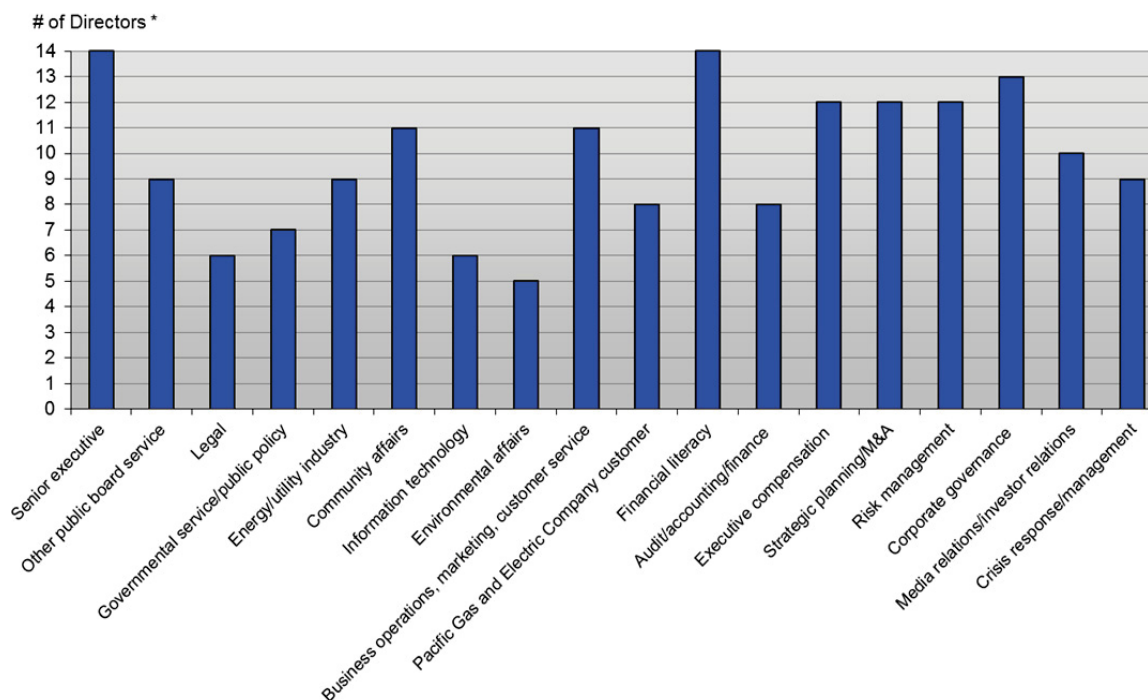
¹⁶ IRs 29, 30, 32

Board Member	Background	Date First Joined	Year							
			09	10	11	12	13	14	15	16
Independent Directors										
Barry Lawson Williams	Business investment and consulting	1990-PG&E 1996-Corp.								
C. Lee Cox	Telecommunications Left 5/2014	1996								
David R. Andrews	Govt. Affairs and Gen. Counsel, food services. Left 12/2013	2000								
Barbara L. Rambo	Financial services and technology	2005								
Maryellen C. Herringer	Attorney, shipping and rail transportation	2005								
Richard A. Meserve	Scientific research, legal counsel, Former Chairman of NRC	2006								
Roger H. Kimmel	M&A, capital markets - investment banking, legal	1/2009								
Forrest E. Miller	Corporate strategy and development, telecom.	2/2009								
Rosendo G. Parra	Marketing, sales and customer service, technology	9/2009								
Lewis Chew	CFO National Semiconductor Audit Partner – KPMG, LLP	9/2009								
Fred Fowler	Retired Chairman, Spectra Energy Partners, Duke Energy	3/2012								
Richard C. Kelly	CEO Xcel Energy	6/2013								
Anne Shen Smith	Retired Chairman and CEO, Southern California Gas	2/2015								
Eric Mullins	CEO of a private equity firm – oil and gas properties	9/2016								

Source: 2009 – 2016 Proxy Statements, September 21, 2016 PG&E Press Release announcing the election of Eric Mullins as a Director.

- The Annual Shareholders Proxy Statement describes the skills and capabilities of each Board member, although Board members indicated they had no direct input to this description. As shown in **Exhibit III-3**, safety is not included in the 18 Board member experience areas highlighted in the proxy statement.

Exhibit III-3 Board Qualifications – End of 2015



Source: May 23, 2016 Joint Proxy Statement.

- The goal of the Nominating and Governance Committee is to create “a balanced and multi-disciplinary Board composed of qualified, dedicated, ethical, and highly regarded individuals who have experience relevant to the company’s operations, understand the complexities of the company’s business environment, and possess capabilities to provide valuable insight and oversight. In conducting this review, the Committee considers factors such as diversity, age, skills, and any other factors that it deems appropriate, and annually reviews and recommends to the Boards the appropriate skills and characteristics required of Board members, given the current composition and needs of each company’s Board.”¹⁷
- The Nominating and Governance Committee uses the skill list previously presented in **Exhibit III-3** to evaluate candidates for the Board.
 - In response to a 2010 Nominating and Governance Committee Performance Evaluation question asking what areas or issues the Committee should consider focusing on in 2011, a committee member commented that the San Bruno incident revealed that no one on the Board had gas transmission and distribution

¹⁷ May 23, 2016 Joint Proxy Statement

experience, and suggested that the Board look at Board composition and a skills matrix to identify any voids.¹⁸

- The Nominating and Governance Committee first used the skills matrix in February 2011. Each incumbent director completed the skills matrix indicating his/her skills, and the committee completed the matrix for three unsolicited director nominees. One of the nominees had significant high pressure natural gas experience, but due to the limitations of the matrix, this experience was classified as merely “Energy/utility industry.”¹⁹ NorthStar cannot speak to the qualifications of the individual who submitted his resume, or the extent of the evaluation process. He was not added to the Board.
- Although the Committee discussed changes to the skills matrix, including splitting the “Energy/utility industry” category into electric, gas and nuclear, the Committee continued to use the original skills matrix in the evaluation of other candidates.²⁰
- In response to 2011 Nominating and Governance Committee Performance Evaluation questions regarding additional skills and experience that would be beneficial to the committee, and what areas or issues the Committee should consider focusing on in 2012, several committee members identified the need to add new directors with electric and gas operating experience.²¹
- Independent Directors with utility experience were added in 2012, 2013 and 2015; one Independent Director retired/departed in 2012 and another in 2013. (See Exhibit III-2).
- After discussing potential candidates for the Board during CY2015, in February 2016, PG&E retained the services of an executive search firm to add another Independent Director to the Board.²² The skills and capabilities sought included one reference to the candidate’s safety-related experience:²³

We are seeking candidates with the skills and experience to help build upon PG&E’s leadership on a national scale in safety, operations and the environment. We are targeting executives with a successful track record of working with complex businesses. The successful candidate will have strong business acumen and demonstrated experience in corporate governance. Experience in the functional areas of environmental policy, cybersecurity/risk or finance would be

¹⁸ DR 006 - CONFIDENTIAL, December 15, 2010 Nominating and Governance Committee Materials, “2010 Nominating and Governance Committee Performance Evaluation.”

¹⁹ DR 006 - CONFIDENTIAL, February 16, 2011 Nominating and Governance Committee Materials, “Nominees for Election to the Boards of Directors of PG&E Corporation and Pacific Gas and Electric Company at the 2011 Annual Meetings.”

²⁰ DR 006 - CONFIDENTIAL December 21, 2011 Nominating and Governance Committee Materials, “Review of Director Qualifications,” Attachment D.

²¹ DR 006 - CONFIDENTIAL December 21, 2011 Nominating and Governance Committee Materials, “2011 Nominating and Governance Committee Performance Evaluation.”

²² DR 625 Attachment 002-CONFIDENTIAL and DR 626

²³ DR 627 Attachment 001

beneficial. Business or political experience in California would also be helpful.

- As a result of the search described above, Mr. Eric Mullins was elected as a director of PG&E Corp. and PG&E on September 21, 2016. Mr. Mullins' experience is in energy-related finance.²⁴
 - Mullins is the Managing Director and Co-Chief Executive Officer of Lime Rock Resources, L.P., Houston, Texas, a private equity firm he co-founded in 2005 that acquires, operates and improves oil and natural gas properties in the U.S.
 - "As we position PG&E for continued long-term success, we welcome Eric's expert counsel around our strategy and audit functions. Eric's deep financial background and familiarity with the energy sector will be invaluable assets for us," said PG&E Corporation Chairman, CEO and President Tony Earley.
 - Before co-founding Lime Rock Resources, Mullins worked in the Investment Banking Division at Goldman Sachs for 15 years.

4. In the wake of San Bruno, the Board became more actively involved in safety issues.

- A review of Board minutes reveals that in the period immediately preceding San Bruno, the Board's consideration of safety issues was somewhat limited. The primary safety-related concerns of the Board centered around PG&E's Operational and Human Performance Improvement Plan, the review of financial and business performance, Short-Term Improvement Plan (STIP) metrics and data presented in the stakeholder safety dashboard developed by PG&E.²⁵ The stakeholder safety dashboard provided data and trends on the eight public safety metrics shown in **Exhibit III-4**. The metrics and associated dashboards evolved over time.²⁶

Exhibit III-4 **Stakeholder Safety Dashboard – Monthly Review**

Primary Indicators	Secondary Indicators
<ul style="list-style-type: none"> • Dig-in Rate • Gas Immediate Response (Service Orders ≤ 60 mins) • Chargeable Motor Vehicle Incidents involving Third Party Vehicles • Notices of Violation (non-administrative) 	<ul style="list-style-type: none"> • Network System Equipment Failure • Incidents of Electric Wires Down • Grade 1 Gas Leaks • 1-800 Am I Driving Safely Rate

Source: DR 006-CONFIDENTIAL (Board Materials).

- The Audit Committee's review of the San Bruno incident was limited to an overview of accounting and recognition of liability resulting from a loss contingency. PG&E Management was asked to present information on third-party liability insurance

²⁴ PG&E press release

https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20160921_pge_corporation_board_of_directors_elects_eric_mullins_as_a_director

²⁵ DR 006-CONFIDENTIAL, Review of Board minutes and materials

²⁶ DR 006-CONFIDENTIAL, Review of Board minutes and materials

regarding the San Bruno incident -- there was no apparent discussion of the company's safety program(s).²⁷

- Immediately following San Bruno, the Board convened special meetings on September 10, 12, and 29, 2010, and held a scheduled meeting on September 15, 2010.
- On November 9, 2010, the Board created a Special Review Committee (SRC) of the Board to look into the circumstances surrounding all matters involving the San Bruno Accident, including a review of: (i) industry practices and emerging best practices; (ii) PG&E's practices and process in these areas; (iii) appropriate changes. The scope included natural gas transmission and distribution system inspection, incident prevention and maintenance; customer reports; incident response and safety culture and practices.²⁸
- On November 11, 2010, the SRC retained a contractor to provide engineering consulting services on behalf of the SRC.²⁹ The contractor provided updates to the SRC on January 28, March 23, and July 12, 2011.³⁰ A draft presentation was provided to the Board for its August 17, 2011 meeting.³¹
- On April 20, 2011, the SVP, Energy Delivery updated the Board on the work of the Utility Executive Safety Panel and the utility's engagement of a consultant to identify culture, communication or leadership gaps.³²
- At its May 11, 2011, meeting the Board discussed the work of the IRP. The results of the IRP investigation were presented to the Board at its June 15, 2011, meeting.
- The SRC contractor presented its results to the SRC on August 17, 2011.³³ Although its focus was on Gas Operations, the report made a number of findings and recommendations that were applicable enterprise-wide. The SRC contractor agreed with the 18 NTSB Recommendations and provided 28 additional recommendations addressing leadership, culture, communication, processes, technology organizational alignment and other areas. It also identified industry role models for 24 gas operations and maintenance practices.³⁴ As noted in the report, "when it comes to safety, there must be 'constancy of purpose'."³⁵

²⁷ DR 006 – CONFIDENTIAL Audit Committee Minutes, 11-2-2010.

²⁸ DR 006-CONFIDENTIAL (November 11, 2010 Resolution of the Board of Directors of PG&E Corp. and of PG&E – November 9, 2010 Special Meeting)

²⁹ DR 006-CONFIDENTIAL (November 11, 2010 Resolution of the Board of Directors of PG&E Corp. and of PG&E)

³⁰ DR 349

³¹ DR 349

³² DR 006-CONFIDENTIAL

³³ DR 349

³⁴ DR 349 Attachment 005

³⁵ DR 349 Attachment 005

- The Board required updates from PG&E on its implementation of the IRP, NTSB and SRC contractor recommendations. The utility's first update was on June 20, 2012. Given the similarity of the recommendations they were grouped in five themes: strategy; investment; risk management; operations; and, culture.³⁶ The second update was June 19, 2013.³⁷

5. The Nuclear, Operations and Safety (NOS) Committee of the Board which was created following San Bruno, elevated PG&E's safety awareness by focusing and prioritizing management's attention.

- Dr. Richard Meserve was selected for his nuclear experience and elected to the Board in 2006. It was another five years before the Board created the NOS Committee.³⁸ The PG&E BOD created the NOS Committee on December 6, 2011, fourteen months after San Bruno and six months after the IRP Report.³⁹
- At a September 21, 2011, special meeting, the Nominating and Governance Committee reviewed benchmarking results regarding Board-level safety, nuclear and risk committees at other companies including S&P 500 companies, PG&E's standard comparator group companies (used for compensation comparisons), and other companies that had experienced pipeline or other accidents.⁴⁰ The survey found:⁴¹
 - Based on data from a 2010 survey, fewer than seven percent of S&P 500 companies had Board-level committees related to safety, risk, environmental or comparable areas.
 - The two other major California investor-owned utilities, Sempra Energy and Edison International, did not have Board-level committees related to safety, risk, environmental or comparable areas.
 - Three of the 30 comparator group companies had Board-level committees with safety in their names.
 - Fifteen of the eighteen companies with nuclear plants had Board-level nuclear committees.
 - Four comparator group companies had risk committees - one audit and risk committee, and two finance and risk committees; the remaining 26 did not.
 - Of the seven entities experiencing accidents, three had Board-level committees with safety in their name.

³⁶ DR 006-CONFIDENTIAL, June 20, 2012 Board meeting agenda, minutes and materials.

³⁷ DR 774

³⁸ DR 006-CONFIDENTIAL

³⁹ DR 006-CONFIDENTIAL, DR 008 and *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011

⁴⁰ DR 006-CONFIDENTIAL, September 21, 2011, Nominating and Governance Committee Minutes

⁴¹ September 21, 2011 materials provided to the Nominating and Governance Committee (DR 006-CONFIDENTIAL)

- The Nominating and Governance Committee agreed to recommend the establishment of an NOS Committee, with the objective of seeking Board approval by written consent prior to the December 21, 2011, regular Board meeting.⁴²
- The NOS Committee is normally attended by all Board members and PG&E executives.
- NorthStar observed an NOS Committee meeting in late 2016, which focused on the Company's progress in improving employee safety incident reporting. A variety of topics were covered.⁴³

6. PG&E's Board supports management's efforts to improve safety. The Board does not lead the PG&E management team but acts in an advisory, review and approval capacity.

- One thing that has not changed since the IRP report is that Board members appear to define their role as approving programs presented by management, rather than leading the effort to improve the safety culture at the company.
- NorthStar's interviews with Board members confirmed their commitment to improving safety at PG&E and they have fully supported the numerous initiatives brought to them for approval.⁴⁴ The Board approved spending related to the Pipeline Safety Enhancement Program in advance of regulatory approvals, understanding that recovery was potentially at risk.⁴⁵
- In interviews with NorthStar, the Board also expressed a willingness to approve future safety-related initiatives that management might propose.
- Board members believe that an improved safety culture is a long-term process characterized as a "journey." They could not project when, if ever, the program would be completed. The Board members could not say when high levels of safety expenditures might be scaled back – which is consistent with the Company's lack of strategic planning for its safety culture.

7. PG&E has developed numerous corporate and LOB initiatives directed at improving safety; however, it does not have a stand-alone comprehensive enterprise-wide safety improvement plan. Any corporate "safety plan" is fluid at best.

- It is clear that there are a significant number of safety improvement initiatives and programs underway at PG&E. All of them contribute in some way to safety and the corporation's safety culture. However, despite numerous requests by NorthStar, a consolidated safety strategy or an enterprise-wide safety culture improvement "plan"

⁴² DR 006-CONFIDENTIAL, September 21, 2011, Nominating and Governance Committee Minutes

⁴³ DR 006-CONFIDENTIAL and DR 008

⁴⁴ DR 615

⁴⁵ IR 255/256

cannot be found.⁴⁶ A “plan” is not the inadvertent product of gathering various, even numerous programs and initiatives that share a common theme. Nor is it the result of observing whether or not “things stick” and moving to other ideas.

- **Exhibit III-5** provides a listing of the numerous initiatives recently implemented or currently underway. The exhibit lists initiatives by category for ease of presentation. Initiatives may touch on more than one category. Selected corporate initiatives are discussed later in this report.

Exhibit III-5 PG&E Safety Initiatives

Safety Culture	Organization/Governance	Misc./Public
<ul style="list-style-type: none"> • Grass Roots Safety Teams (in existence prior to San Bruno) • Safety Culture Assessment • Change in Discipline Policy • Near Hit Program • Safety Leadership Workshops • Corrective Action Program • 6 Workshops, 360-Degree Assessments and 1:1 Coaching • Safety Index in Premier • Reach Every Employee • Safety Culture Initiative • Safety Conversations • Gas Matters Newsletter • Facilitative Leadership and Crucial Conversation 	<ul style="list-style-type: none"> • Standard roles and responsibilities in field safety • Enhanced safety governance structure • Safety reorganization to include health and environment • Corporate safety service level agreements • Electric Operation Safety Council • Keys Meeting • Gas Operations Risk and Compliance Committee • Gas Operations daily calls • Nuclear Safety Culture Monitoring Panel • Generation Safety Council 	<ul style="list-style-type: none"> • Changes in reported metrics • Developed Rapid Incident Notification system • 911 Standby Response • Risk Informed Budget Allocation • Picarro testing • Centerline Survey • Eight Gas Asset Families • New Control Center/Dispatch • Super Gas Ops/Super Crews • PAS 55 (Publicly Available Specification 55)/Internals Organization for Standardization (ISO) 55001 Certification • Pathfinder Implemented • American Petroleum Institute (API) 1173 Certification • Winters Training Facility • Mariner • Generation Risk Information Tool
Motor Vehicles	Risk Mitigation	Prevention/Early Intervention
<ul style="list-style-type: none"> • Telogis • Phone Free Driving • Driver Skills/Knowledge • Truck Rodeos 	<ul style="list-style-type: none"> • Safety Principles/Keys to Life • Contractor Safety Program • Employee Knowledge and Skills • SIF Prevention Program • Power Generation Lockout-Tag out • Hydro Enterprise Risk Management Gaps Closed 	<ul style="list-style-type: none"> • 24/7 Nurse Report Line • Industrial Athlete • Ergonomic - office and industrial • On Site Physical Therapists

DR 144.

- NorthStar shared preliminary impressions with PG&E executive management regarding NorthStar’s difficulty in locating a consolidated safety planning work product.⁴⁷ Each President cited individual LOB efforts. Each of the primary operational LOBs has its own plan, and S&SS (Corporate Safety) has a separate plan.

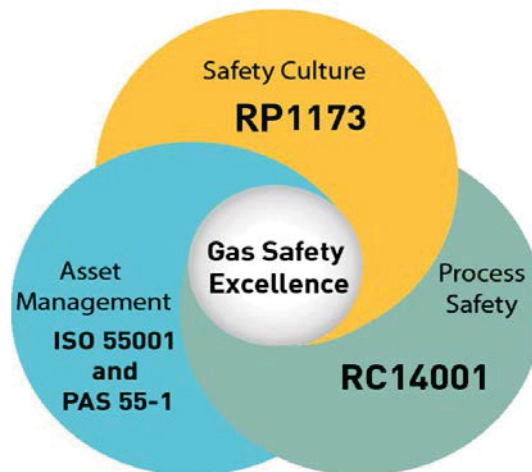
⁴⁶ DRs 211, 533, 535 and IRs 69, 255, 256

⁴⁷ IR 255, 256

As used in this report, Corporate Safety refers to the enterprise-wide function performed by S&SS.

- Gas Operations cites its “Gas Safety Excellence – Safety Management System” illustrated in **Exhibit III-6** as its safety strategy.⁴⁸

**Exhibit III-6
The Way We Do Safety**



Source: DR 004 Supplement 001, Attachment 003, page 27.

- Electric T&D created its Electric Operations Improvement Plan on September 15, 2011.⁴⁹ Electric T&D is “focused on creating a culture based on trust where employees feel comfortable speaking up, stopping jobs, sharing incidents or near hits, and learning from one another – without discipline or fear of reprisal.”⁵⁰ The fundamental elements driving culture change are illustrated in **Exhibit III-7**.

**Exhibit III-7
ET&D Safety Program Fundamentals**



Source: DR 004 Supplement 001, Attachment 002.

⁴⁸ DR 004 Supplement 001, Attachment 003, page 27

⁴⁹ DR 505 Attachment 001

⁵⁰ DR 004 Supplement 001, Attachment 003, page 36

- Power Generation conducted a gap assessment of hydro system safety as part of the Enterprise Risk Management process.⁵¹ Generation's safety culture strategy consists of:⁵²
 - Safety culture development
 - Safety conscious work environment – “Speak-Up Culture”
 - Organizational effectiveness leadership model: Engage, Enable, Sustain
 - Industrial safety
 - Emotional safety and trust.
 - As part of its integrated planning process in June 2013, S&SS recognized that efforts “need to be integrated into a comprehensive enterprise safety strategy supported by enhanced governance and funded appropriately.”⁵³ This did not occur. The lack of a comprehensive strategy creates the potential for both gaps and redundancies/inefficiencies.
 - On July 15, 2016, in response to a data request, PG&E provided NorthStar with the six components that comprise its multi-year safety plan as approved by the Enterprise Safety and Risk Committee on February 2, 2016, and shared with the NOS Committee in February 2016. This February 2016 plan cannot be directly tied to the output of the integrated planning process, differs from the plan provided in April 2016, and again considers only the focus of Corporate Safety. The six components of the February 2016 plan are as follows:
 - Enhance Leadership Capacity and Commitment to Improving Safety Culture
 - SIF Mitigation
 - Contractor Safety/Kern OII Compliance
 - Motor Vehicle Safety
 - Fully Deploy Workforce Health Early Intervention Initiatives
 - Safety Management System (SMS).
- 8. PG&E has been slow to address safety culture despite the San Bruno incident and third-party recommendations in 2010 and 2011. It was not until mid-2014 that PG&E requested funding for an Enterprise Safety Culture Change Program, and the program priorities continue to shift.**
- The Enterprise Safety Culture Change Program has not been fully implemented.

⁵¹ DR 768

⁵² DR 004 Supplement 001 Attachment 005, page 4

⁵³ June 7, 2013 S-1 (DR 039 Supplement 001, Attachment 005-CONFIDENTIAL)

- PG&E’s safety culture is more organic and personality-driven than the result of a cohesive plan. The most significant early cultural changes were PG&E’s change in its discipline policy in 2011/2012 and efforts within the LOBs to foster a “speak up culture.” PG&E changed its safety discipline policy shifting from incident-based disciplinary actions to deter unsafe behaviors to a behavior-based program designed to promote a successful safety culture.⁵⁴
- In response to an August 20, 2010, employee fatality and other prior avoidable injuries (despite reported improvements in safety metrics), PG&E convened a cross-functional panel, assisted by a third-party to conduct a leadership assessment of the utility’s safety culture, management and communications. The review involved seven work streams: a survey of employees, focus groups, executive interviews, front-line manager interviews, analysis of existing safety data, benchmarking and public stakeholder data.⁵⁵ As part of this assessment, PG&E conducted site visits to two other utilities. Many of the findings cited in the panel’s August 25, 2011, report persist today. Improvements noted by NorthStar are in parens.
 - PG&E lacks a system-wide strategic approach for safety.
 - The metrics PG&E uses to measure safety are incomplete and drive the wrong behavior. (Some improvements have been made.)
 - Current data-gathering systems are scattered and incomplete.
 - Leadership is not as visible or accessible as most employees want or as stronger safety results demand. (Some improvements have been made.)
 - There are challenges with the credibility of non-traditional leaders in the field.
 - Employees overwhelmingly report that they understand and follow safety rules, but safety results show otherwise.
 - The administration of discipline is ineffective. (Policy changed.)
- In February 2011, PG&E conducted a culture survey, safety audit and Occupational Health and Safety Systems Assessment. PG&E engaged a third-party to assist with the review. Key findings from the 2011 report included the following, some of which exist today:⁵⁶
 - Ownership of safety is unstructured.
 - The prevailing focus is on following rules, rather than recognizing and controlling exposure.
 - Safety seems to be treated as a burden, rather than an integral part of the business.
 - Communication tends to be one-way from leaders down, and collaboration with front-line workers is perceived by workers to be non-existent.
- In 2014, S&SS requested \$6.4 M additional funding for the initial costs associated with a 4½ year focused safety culture change program. Post-2014 costs were

⁵⁴ DR 004 Attachment 004

⁵⁵ DR 048 Attachment 001

⁵⁶ DR 048 Attachment 002 - CONFIDENTIAL

estimated at \$22.5 M.⁵⁷ This plan had not been identified in the 2013 integrated planning process (discussed in detail in **Chapter VI: Budgeting and Spending**). The funding request covered three foundational elements and three leadership elements:

- Safety governance structure improvement
 - Safety resource roles and responsibility clarification
 - Serious Injury or Fatality (SIF) process implementation
 - Executive Safety Leadership Development
 - Supervisor and manager safety leadership
 - Front line worker safety skill development (peer-to-peer observations).⁵⁸
- **Exhibit III-8** provides the Safety Culture Roadmap provided to NorthStar in April 2016. It reflects the 2014 funding request, but is disconnected from the “official” plans produced as part of PG&E’s integrated planning process.

Exhibit III-8 Safety Culture Roadmap



Source: DR 004 Attachment 004

- The six items identified as the Safety Culture Roadmap in **Exhibit III-8** were largely driven by recommendations by an outside expert rather than a comprehensive plan.⁵⁹ PG&E did not perform a detailed analysis of its most critical safety-related problems and how best to address them. PG&E provided no detailed business case beyond the initial funding request.
- Priorities and projects have shifted since the 2014 approval of funding for the safety culture change program.

⁵⁷ May 27, 2014 Safety Culture Program Presentation to the Financial Planning Committee (DR 314 Attachment 003)

⁵⁸ May 27, 2014 Safety Culture Program Presentation to the Financial Planning Committee (DR 314 Attachment 003)

⁵⁹ DR 70

- As the “official” safety culture plan provided to us was circa 2016, NorthStar issued numerous requests to determine whether there was an earlier broad safety culture plan. Differing safety culture roadmaps were provided in response to NorthStar’s data requests, but most were from the 2016-time period.

9. The existence of a significant number of initiatives without a comprehensive change management plan impacts PG&E’s ability to realize improvements in its safety culture.

- PG&E initiated numerous initiatives without a comprehensive plan, resulting in initiative overload. Initiative overload can cause fatigue, confusion, dilute critical messages, and result in key strategies being lost in the shuffle. Employees may ignore the plethora of initiatives and become increasingly disconnected from leadership. Too many initiatives with insufficient consideration for impact, implementation requirements, or saturation level may have slowed PG&E’s progress in changing the safety culture.
- PG&E did not prioritize its initiatives to ensure the most critical initiatives have been identified and are implemented effectively.
- Different initiatives often depend on the same executives, managers or supervisors for design, approval and implementation. This leads to “limited managerial bandwidth” and initiative fatigue.
- A cultural shift as large as that required by PG&E warrants a specific communications and change management plan to ensure the message was being appropriately conveyed and targeted to each audience. PG&E relies extensively on “down-briefing” with no assurance the messages are adequately communicated.

10. NorthStar’s interviews and field observations reveal that there is no one “culture” or “safety culture” at PG&E. While the definition of “safety culture” may be consistent throughout the organization, the post-San Bruno safety culture is not yet deeply embedded throughout the organization.

- As previously discussed, each LOB has its own safety plan. Risk exposure and risk propensity differs by LOB.
- The different state of each LOB’s journey along the safety curve was evident in interviews and meetings.
 - DCPD culturally differs from the rest of the organization given the level of regulation and oversight, and is generally viewed as distinct and different by other utility functions.
 - Substation and Power Generation are viewed by some as having better safety performance and a better safety culture than other organizations.
 - The culture at 77 Beale and 245 Market, differs from that in San Ramon.
 - To some extent, the culture reflects the outlook of each Officer or Director.

- The culture in each field location differs from that at corporate, and differs from one location to the next, and from Supervisor or crew to the next.
- Corporate Safety views itself as the architect of safety culture. In contrast, the operational LOBs view Corporate Safety as a support function at best, but largely distinct and unrelated.

D. RECOMMENDATIONS

1. Add safety to the list of qualifications used in selecting Independent Directors to the Board(s) of PG&E Corp. and PG&E. Periodically revisit the qualifications matrix and requirements for Independent Director as the industry and requirements change. Add Independent Directors to the Board who have experience with safety, perhaps in another industry such as aviation.
2. Reassess and stabilize the safety culture change initiatives. The rigor applied to the integrated planning process (discussed in **Chapter VI: Budgeting and Spending**) should be applied to safety culture. The overwhelming number of initiatives and constant shifting of priorities is detrimental to a stable, consistent safety culture. The SRC's consultant aptly described it: "when it comes to safety, there must be 'constancy of purpose'."⁶⁰
3. Develop a comprehensive safety plan (by the end of 2017) that incorporates LOB and Corporate Safety activities to eliminate duplication, prevent gaps and appropriately prioritize expenditures. The plan should address culture, employee health and wellness, contractor safety, employee safety and public safety. Solicit input from throughout the organization, particularly the field, in the development of the plan. The environmental function was recently removed from the Safety Health and Environment organization. Environmental should have its own plan. Elements of the plan should include:
 - Clear definition of the problem
 - An in-depth, data-driven evaluation of the current as-is state
 - Definition of the to-be state (i.e., what does good look like)
 - Roles and responsibilities of corporate safety vis-a-vis LOB personnel
 - Tangible goals and objectives
 - Staffing/resource requirements and personnel qualifications
 - Clear assignment of responsibilities
 - Realistic timeline
 - Metrics to assess effectiveness
 - Defined budget
 - Action plans
 - Communications and change management plan.

The plan should be updated annually for at least two years and then at least every three years thereafter, with quarterly/annual monitoring of progress relative to the plan. The

⁶⁰ DR 349 Attachment 005

comprehensive plan should include all safety plans and programs of the Company, except for specific asset-related safety plans (such as asset management plans, leak survey programs or vegetation management) that should continue to be the responsibility of the various LOBs. The plan should be approved by the NOS Committee and the Boards, and endorsed and supported by executive management and the CPUC. The plan must be clearly communicated throughout the organization.

4. Clearly define and articulate any new initiatives to improve safety culture. Perform cost-benefit analyses of these initiatives and identify performance measures. Corporate Safety recently produced an analysis of lost work days that might serve as a starting point for the thought process and analytics involved. (DR 831)
5. Internal Audit should play a more active role in auditing safety controls, programs and processes.

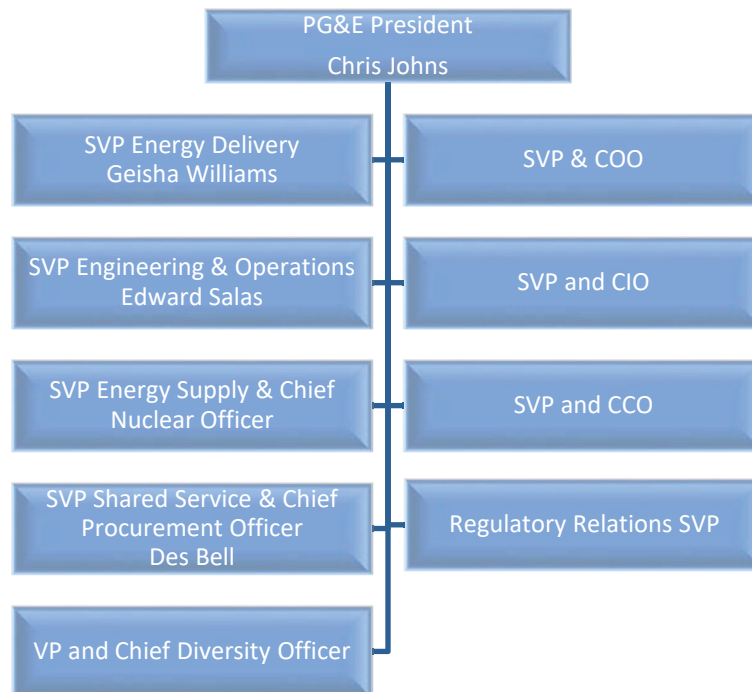
IV. ORGANIZATION

This Chapter provides the results of NorthStar’s review of PG&E’s overall organization and whether it contributes to a positive safety culture. The IRP expressed a number of organizational concerns, including frequent management changes and dysfunction from excessive layers of management. According to the IRP, PG&E had been in a state of perpetual organizational instability for more than a decade. Through interviews, the Panel learned that throughout this entire period, the system design, field engineering, pipeline integrity management and related operating functions were split among multiple officers, creating silos of expertise, but also creating difficulties in communications. In certain silos, there were as many as nine levels between the CEO and the front-line employee. As a result, the management setting the direction was distant from those who have the responsibility for executing the work. The Panel also expressed concern that top management’s interests and expertise was in financial performance, which diluted the company’s focus on one of its core missions – that of safe and reliable natural gas service.

A. BACKGROUND

The PG&E organization structure at the time of San Bruno is shown in **Exhibit IV-1**. Throughout the report, PG&E officers and individuals cited in PG&E’s press releases are named, other employees are not.

Exhibit IV-1
PG&E Organization Structure as of December 31, 2010



Source: DR 003 Attachments 001 and 002.

In September 2010, gas operations organizations reported to two different SVPs:

- SVP Energy Delivery – Geisha Williams
 - VP – Gas M&C
- SVP Engineering & Operations – Edward Salas
 - VP – Gas Transmission & Distribution
 - VP – Gas Transmission Programs
 - VP – Transmission & Distribution Business Operations
 - VP – Electric Transmission Planning & Engineering
 - VP – Electric Distribution Planning & Engineering.¹

In June 2011, PG&E created separate organizations for Electric and Gas Operations, with both organizations reporting to an Executive Vice President (EVP). Ms. Williams was promoted to EVP of Electric Operations and Mr. Nicholas (Nick) Stavropoulos, an experienced natural gas pipeline operations executive, was hired as EVP of Gas Operations.

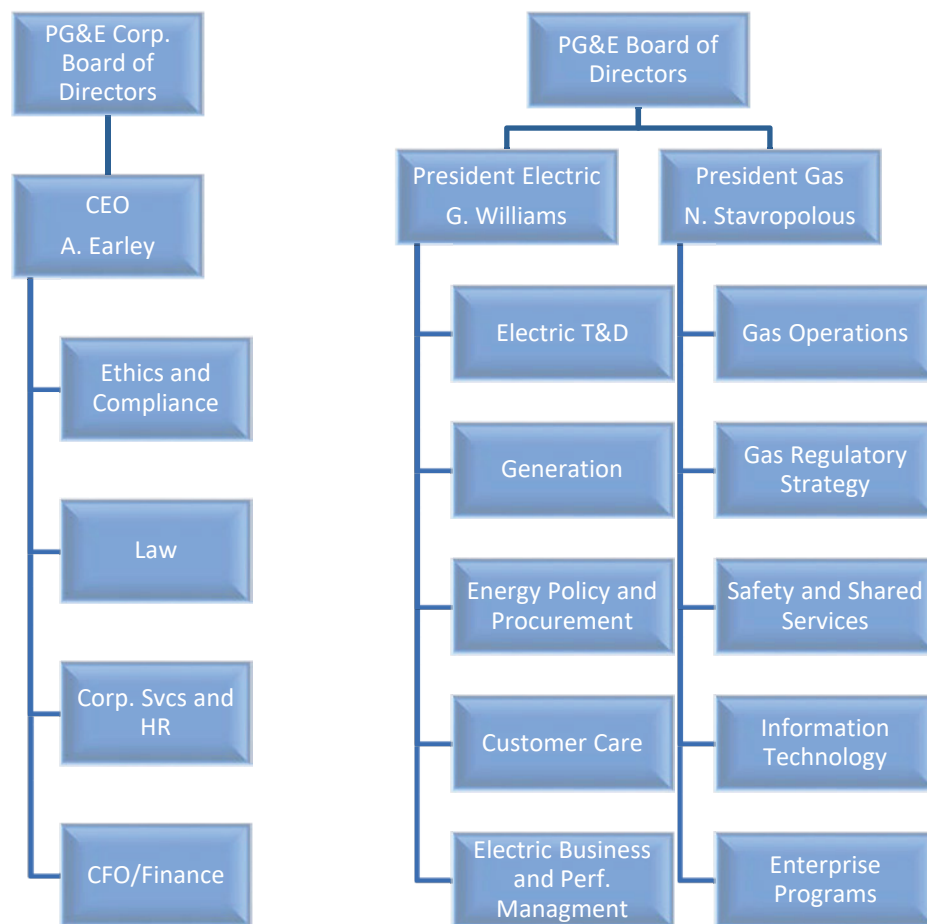
In August 2015, Mr. Johns stepped down as President, and the utility was again restructured. The 2015 restructuring established separate organizations for Gas and Electric, with two different presidents. Ms. Williams was elected President of PG&E Electric and Mr. Stavropoulos was elected President of PG&E Gas. Mr. Earley continued as Chairman, CEO and President of PG&E Corp. Mr. Johns continued as Vice Chairman until his retirement at the end of 2015.²

Exhibit IV-2 provides the organization structure in April 2016, when NorthStar began its review.

¹ DR 3 Attachment 2

² PG&E press release http://www.pgecorp.com/aboutus/our_team/CPJohns.shtml

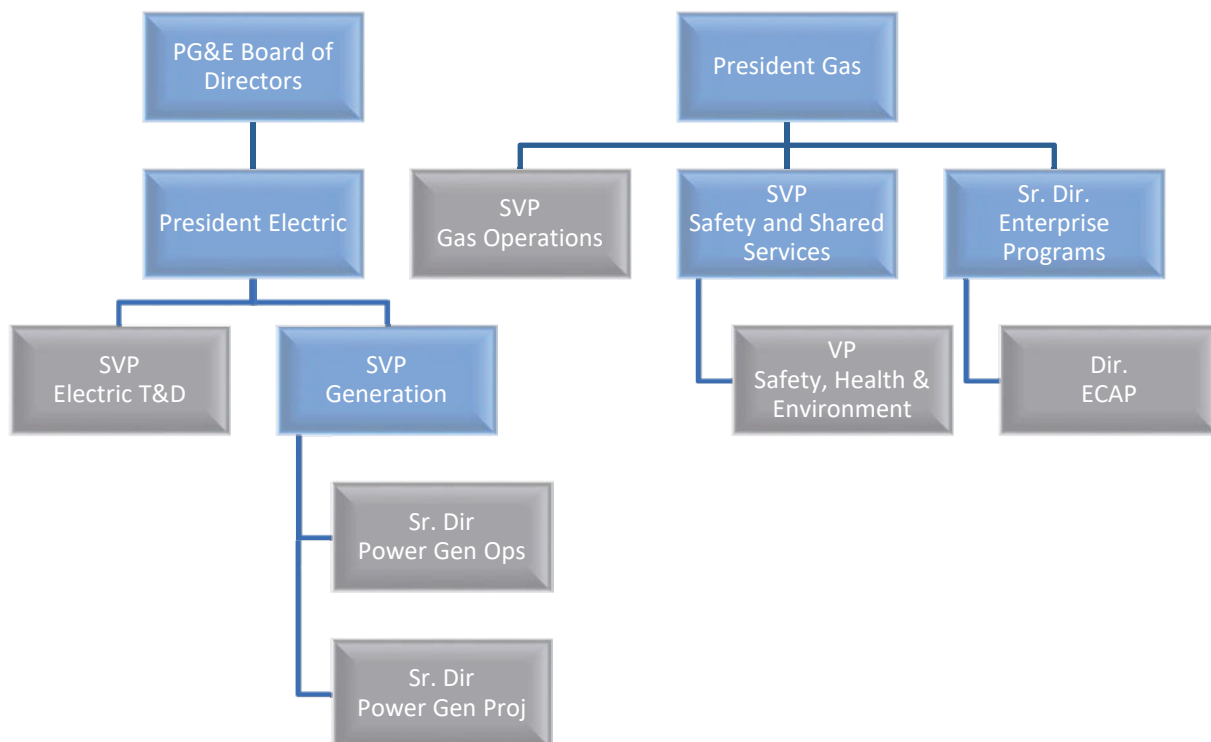
Exhibit IV-2
April 2016 Organization Structure



Source: DR 004 Supplement 001 Attachment 012, DR 001 Attachment 001.

Exhibit IV-3 shows the reporting relationships of various organizations discussed in this report. The Safety, Health and Environment (SH&E) organization within S&SS has primary responsibility for many of the initiatives discussed throughout this report.

Exhibit IV-3
Key Safety Organizations – July 2016



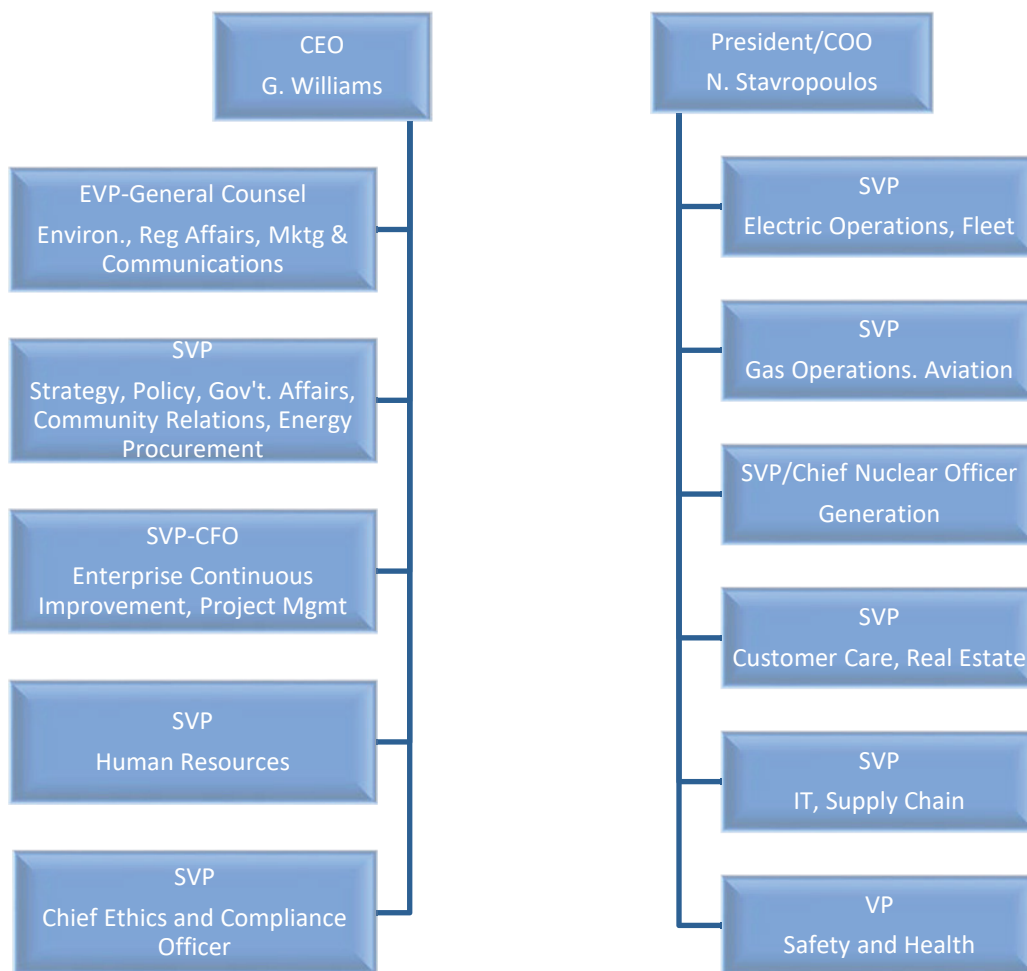
Source: DR 1 Attachment 1.

The PG&E organization structure changed again in late 2016, returning to a one-president structure. On November 14, 2016, the PG&E Corp. Board elected Ms. Williams as CEO and President of PG&E Corp.; Mr. Stavropoulos to serve as President and COO of the Utility; and Mr. Earley to serve as Executive Chair of the PG&E Corp. BOD. These positions were effective March 1, 2017. **Exhibit IV-4** provides the high-level organization structure as of March 2017. As part of the reorganization, PG&E plans to reduce the number of officers by 15 percent, or eight positions, resulting in a flatter, more nimble, decision-making structure.³ This change was scheduled to occur after NorthStar's investigation.

Following the appointment of Ms. Williams as CEO and Mr. Stavropoulos as President and COO of the Utility, PG&E split Safety and Health from Environmental, and removed Safety and Health from the Shared Services organization. Safety and Health now reports to the President and COO of the utility, with a reporting relationship to the Board of Directors' Nuclear Operations and Safety (NOS) Committee. A new lead safety officer with operational experience was selected as part of the organizational change. The final organization structure had not been defined at the time of NorthStar's review.

³https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20170111_pge_streamlining_management_implementing_efficiency_measures_to_keep_customer_bills_affordable_while_investing_in_the_future

Exhibit IV-4
March 2017 Organization Structure



Source: https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20170111_pge_streamlining_management_implementing_efficiency_measures_to_keep_customer_bills_affordable_while_investing_in_the_future.

In very broad terms, the LOBs have primary responsibility for ensuring public, contractor and employee safety. The SH&E (also referred to as Corporate Safety) is primarily focused on employee safety, safety culture and safety systems. Corporate Safety provides support to the LOBs, designs and administers health and wellness programs, coordinates the development of the contractor safety program, administers the various safety and incident reporting systems, performs analysis, develops work standards and procedures, designs programs that span the organization and provides subject matter expertise in safety regulations, compliance requirements, and incident causal evaluation.

Exhibit IV-5 provides a high level overview of the LOB safety responsibilities.

Exhibit IV-5 Safety Responsibilities

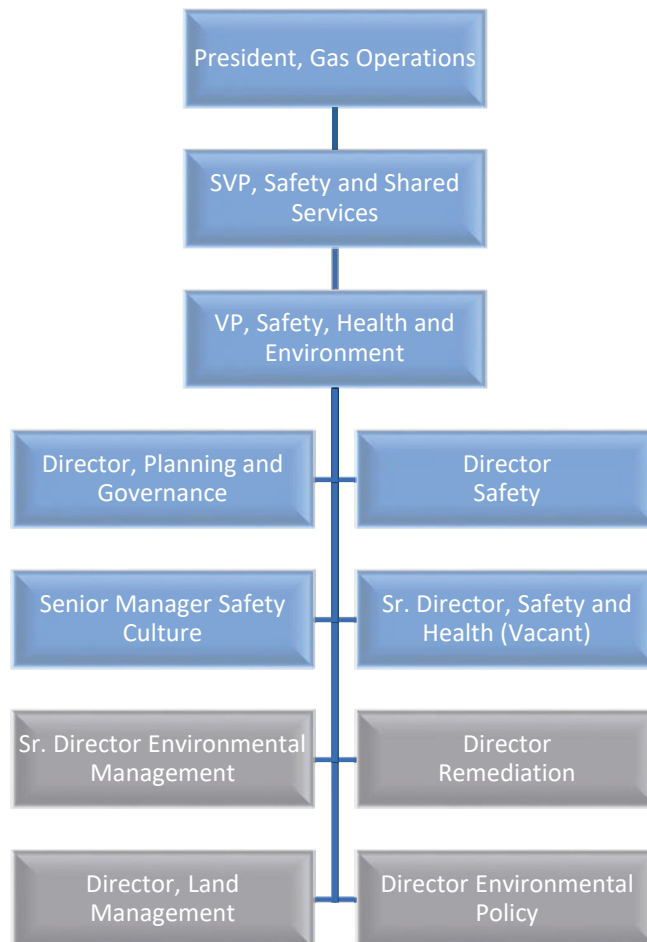
Category	Primary Organizational Responsibility	Discussion
Broad Categories		
Asset Safety, Integrity and Reliability	LOBs	<ul style="list-style-type: none"> Ongoing operations, maintenance and construction programs.
Public Safety	Corporate Communications LOBs	<ul style="list-style-type: none"> Corp Comm. – Advertising campaigns such as wires down, safe digging, tree safety. LOBs – Public awareness programs, education, signage, fencing.
Employee Safety	Corporate Safety LOBs	<ul style="list-style-type: none"> Corp Safety Specialists – Site observations, corporate programs. LOBs – Direct responsibility for employee oversight, safety specialists.
Contractor Safety	Corporate Safety LOBs	<ul style="list-style-type: none"> Corp Contractor Safety oversees LOB programs. LOBs implemented contractor safety procedures in 2016 and are directly responsible for contractor safety.
Industrial Safety	Corporate Safety	<ul style="list-style-type: none"> Standards & Programs is responsible for industrial hygiene programs which address prevention and control of occupational environmental factors or stresses and communications related to occupational and public health issues.
Environmental Safety	Safety and Shared Services	<ul style="list-style-type: none"> Environmental Management and Programs is responsible for environmental risks, including lead-based paint, the remediation groundwater contamination and the management of manage oil-filled electric equipment.
Safety-Related Compliance	Corporate Safety LOBs	<ul style="list-style-type: none"> Corp. Safety provides SME and performs audits. LOBs are responsible for ensuring compliance.
Health and Wellness	Corporate Safety	<ul style="list-style-type: none"> Corporate Safety's Standards and Programs organization includes Workforce Health and is responsible for workforce health initiatives.
Specific Programs Discussed in this Report		
24/7 Nurse Report Line	Corporate Safety	<ul style="list-style-type: none"> Planning and Governance oversees the third party vendor for the nurse report line. The 24/7 Nurse Report Line is an injury and illness management system that provides PG&E employees with 24/7 telephonic access to nurses and physicians.
Ergonomic Programs	Corporate Safety LOBs	<ul style="list-style-type: none"> Standards and Programs manages enterprise-wide ergonomic programs. Electric T&D Grass Roots Safety Team ergonomic teams work to implement solutions to reduce strains and sprains. Targeted areas include data analysis, benchmarking, task analysis, materials labeling, tools/equipment analysis, educations/awareness, and training.
Telogis	Corporate Safety	<ul style="list-style-type: none"> The primary goal of this initiative is to help PG&E drivers become safer drivers through the application of real-time feedback, self-corrective actions, and regular online reporting to identify trends and address safety risks.
Industrial Athlete	Corporate Safety	<ul style="list-style-type: none"> Workforce Health is responsible for Industrial Athlete program for field employees to reduce injuries and improve mental/physical resilience.

Category	Primary Organizational Responsibility	Discussion
Guardian	Corporate Safety	<ul style="list-style-type: none"> Planning and Governance is responsible for the Guardian observation tool used by Corporate Field Safety Specialists and Field Supervisors.
Safety Data and Analytics	Corporate Safety	<ul style="list-style-type: none"> Planning and Governance is responsible for safety data and analysis. LOBs perform analysis on an as-needed basis.
Significant Incident Investigations	Corporate Safety LOBs	<ul style="list-style-type: none"> LOB and Corporate Field Safety Specialists. If it is a serious incident, Corporate Safety Investigation Team leads the causal evaluation.

Source: NorthStar Analysis, Verification DR 891.

During most of NorthStar's review, SH&E consisted of eight areas reporting a VP, as shown in **Exhibit IV-6**. Non-environmental safety groups are shaded in blue and described following the Exhibit.

Exhibit IV-6 **2016 S&SS Organization Structure**



Source: DR 001, Supplement 001.

Planning and Governance consists of 24 full-time employees. Its responsibilities are as follows:⁴

- Acts as a single source for safety, health and environmental data.
- Provides data reporting and analysis and data driven hypothesis.
- Enables and governs IT improvements for the Corporate Safety Organization.
- Manages continuous improvement initiatives within Corporate Safety.
- Benchmarks processes.
- Leads the Guardian Observation program to reduce workplace risk. The Guardian Observation Tool consists of both a web-based portal and mobile application that allows employees to record and communicate behavior-based safety observations in near real-time. Each LOB can develop a unique “portal” that contains customizable checklists with specific behaviors or conditions that can be observed in the field and recorded as “safe” or “at risk”.⁵
- Provides project governance and project communication support.
- Leads Corporate Safety’s participation in the Integrated Planning Process.

Safety Culture organizations provide Safety Leadership Coaching and Leadership Training. The Safety Culture Team was created in 2014 and led by a Director who is nearing retirement. A Senior Manager was brought in in mid-2015. The team also includes Safety Leadership Coaches, Leadership Training Instructors and a Business Operations Specialist. Specific responsibilities of the Safety Culture team are to:⁶

- Build, implement and sustain safety leadership development:
 - Workshop content and delivery for Safety Leadership skills for Supervisors/ Superintendents and Officers and Directors.
 - Workshop content subject matter expertise in partnership with Human Resources (HR) for Safety Leadership skills for Crew Leaders and above (2017 and beyond).
 - 360-degree feedback review and in-field coaching for supervisors and above. 360-degree feedback refers to the process in which employees receive feedback from the people who work around them. This typically includes the employee's manager, peers, and direct reports.
 - Development of safety leadership learning assessment metrics.
- Provide subject matter expertise to guide surveys and metrics relevant to safety culture.
- Partner with corporate communications and the LOBs to enhance a speak-up safety culture.

Safety and Health is responsible for compliance with safety standards and regulations; development of methods and procedures; management of disability and time off programs and workers’ compensation; development and implementation of various health and wellness programs; oversight and coordination of enterprise-wide safety initiatives; incident

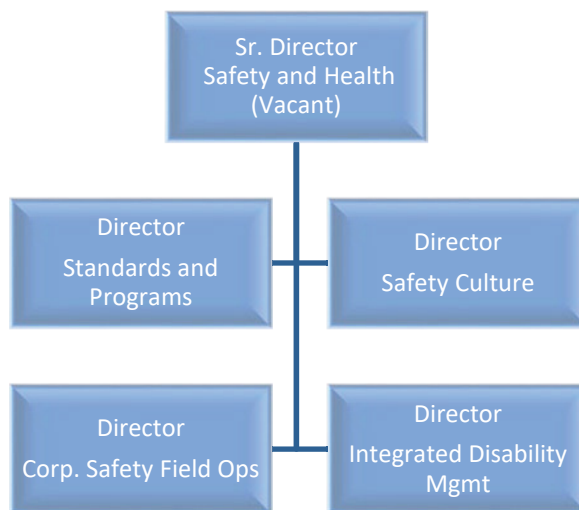
⁴ DR465

⁵ DR 59

⁶ DR 465 Attachment 001, IR 81A, IR 72, DR 001 Supplement 001

investigations; and, support and subject matter expertise for field operations to reduce injuries and exposures. The organization is depicted in **Exhibit IV-7**.

Exhibit IV-7
Safety and Health Organization Structure



Note 1: Does not include two Sr. Directors Assistant positions, one of which was open and one was vacant.

Note 2: The responsibilities of the Director, Safety Culture were described as part of the Safety Culture Team discussion.

Source: DR 001, Supplement 001.

Standards and Programs consists of 28 full-time employees. This organization is responsible for enterprise safety compliance related to safety regulations, standards, and procedures. This organization includes Integrated Health Management (17 programs), the Motor Vehicle Program, the Contractor Safety Program and the SIF Program are part of this organization. A number of these programs are described in further detail in **Chapters VI: Budgeting and Spending** and **IX: Safety Reporting/Corrective Action**. This organization's focus is helping its business partners reduce injury exposure and improve health in the following manner:⁷

- Develop and manage enterprise safety and health programs (motor vehicle and ergonomics) and partner with the LOBs to ensure programs and processes are in place (i.e., job hazard analysis, industrial hygiene, life safety and ergonomic programs).
- Develop enterprise standards and guidance.
- Provide technical and practical interpretation on safety regulations, procedures and standards.
- Identify and communicate applicable regulatory and Company requirements (e.g., asbestos, confined space and excavation).
- Partner with the LOBs to ensure adherence to regulatory requirements (e.g., working at heights and confined spaces).
- Performs safety and compliance audits.

⁷ DR 465, DR 001 Supplement 001

Integrated Disability Management manages the disability and time off programs and policies. Areas of responsibility include:⁸

- Develop and implement disability and time off plans and policies, ensuring compliance with Federal and State laws.
- Self-insured and self-administered Worker's Compensation programs.
- Proactive and reactive advocacy for employees with work-related and non-work-related injury and illness.
- Shared Services payment services.

Corporate Field Safety Operations consists of about 36 positions, including safety specialists. In general, the responsibility of this organization is to provide subject matter expertise and field support to LOB partners to reduce injury exposure and improve health. Corporate Field Safety Operations was being reorganized during NorthStar's review (the reorganization is discussed later in this chapter.)⁹ As of the end of August 2016, its activities included:¹⁰

- Conducting data analysis to identify risk and exposures and presenting findings to the LOBs, including implications and recommendations resulting from observations, incidents, initiatives and exposures.
- Leading causal analysis on serious incident investigations and providing consultation on non-serious incident investigations.
- Making recommendations and providing guidance on hazards and exposures while providing coaching and feedback to correct any at-risk acts and conditions.
- Creating, developing and delivering enterprise-wide safety communications including 5-minute meetings, safety flashes, and investigation reports.

Safety Specialists

At the time of NorthStar's review there were both Corporate Safety Field Safety Specialists (Corporate FSS) and LOB FSS:

- Corporate FSS are part of the Corporate Field Safety Operations group. They are organized by LOB and have knowledge of Cal/Occupational Safety and Health Administration (OSHA) regulations and how they apply to the LOB they support. All of the corporate safety specialists were OSHA 30-certified in 2015 (this certification training is a one-time training).¹¹ Ten Corporate FSS support Electric T&D; eleven support Gas Operations; eleven support Generation and ten support the other LOBs (Customer Care, S&SS and IT).¹²
- LOB FSS are generally individuals with specific field expertise in the designated LOB operations and understanding of the work being performed (i.e., former linemen

⁸ DR 465 Attachment 001

⁹ DR 001, Supplement 001, DR 465

¹⁰ DR 465

¹¹ DR 146, DR 217

¹² DR 146, DR 217

for Electric T&D). These individuals are not required to have Safety Specialist Certifications.

Electric T&D Field Safety Specialists

Prior to 2012, Corporate Safety provided all Electric T&D FSS. In 2012, Electric T&D began adding safety specialists. In mid-2016, five FSS working for the Electric Distribution Safety and Workforce Excellence (SW&E) organization supported Electric Distribution, and five additional FSS supported Electric Transmission. These specialists are located in various field offices.¹³

Exhibit IV-8 provides the number of Electric T&D safety specialists from 2011 to 2016.

**Exhibit IV-8
Safety Specialists**

Organization	2011	2012	2013	2014	2015	2016
Electric T&D						
Transmission	0	0	0	0	5	5
Distribution [1]	0	7	7	7/5	5	5
Corporate	16	16	15	14	13	10

Note 1: Seven until June 1, 2014 and 5 until year end 2014.

Source: DR 146.

At the time of NorthStar's review, each Electric T&D FSS covered from 97 to 440 field personnel.¹⁴ The Corporate FSS supporting Electric T&D each covered from 19 to 125 employees.¹⁵

The primary required skill/qualification to be an Electric T&D FSS is technical subject matter expertise in an electrical craft. The minimum qualifications include 5 years of electrical work experience in complex utility or industrial environment, experience working in a union environment, and experience leading detailed safety incident investigations. All Electric T&D field safety specialists meet the first two qualifications, and five of the ten have experience leading a detailed safety incident investigation.¹⁶

Gas Operations Field Safety Specialists

There are three Gas Operations FSS; one each covering the north, central and south regions.¹⁷ Gas Operations Safety Specialists are required to have a minimum three years' gas work experience in complex utility or industrial environments and experience working in a union environment. They are not required to have specific certifications, but must have a working knowledge of industry standard and regulations and be proficient in hazard

¹³ DR 146

¹⁴ DR 368

¹⁵ DR 368

¹⁶ DR 367

¹⁷ List of safety specialists and locations provided to NorthStar as part of the interview process.

identification and mitigation processes.¹⁸ Gas Operations FSS must have a Bachelor's Degree or equivalent and 3 to 7 years' experience depending on the position.¹⁹

Power Generation Field Safety Specialists

There are six FSS and a Safety Manager within Power Generation: four support hydro; one supports fossil and renewable generation; and, one supports project execution including contract work and general construction.²⁰ Power Generation FSS are also typically former crew members and are not required to have specific safety certifications.

B. EVALUATIVE CRITERIA

- Has the change in the Companies' organization structure contributed to a strong safety culture throughout the entire organization?
- Have the organizational changes, in terms of layers, spans, and new reporting relationships, contributed to increased safety culture within the organization?
- Are there the appropriate number and level of personnel who have been given safety culture enhancement as their primary job function?
- Is there a real safety organization within PG&E that focuses on culture and safety improvement and does it report to the appropriate level? Are there organizations whose primary functions are to help develop, implement and support a safety strategy?
- Does combining safety and shared services provide sufficient emphasis on safety for the organization? Is there adequate attention paid to safety, given the other responsibilities of that management group?

NorthStar developed these evaluative criteria in May 2016, when the "two president structure" was in place. At the end of NorthStar's fieldwork in November 2016, PG&E returned to a single-president organizational structure. The conclusions in the report address these changes to the extent possible.

C. FINDINGS AND CONCLUSIONS

1. In 2011 and 2012, PG&E made some positive high-level organizational changes in response to the San Bruno; however, this did not extend to Corporate Safety.

- In September 2011, Mr. Tony Earley was elected to serve as Chairman, CEO, and President of PG&E Corp.²¹ Mr. Earley brought utility experience and an increased emphasis on risk-based integrated planning to PG&E.
 - Before joining PG&E Corp., Mr. Earley served in a number of executive leadership roles during 17 years at DTE Energy, including Executive Chairman, Chairman and CEO, and President and COO.

¹⁸ DR 328 Attachment 002

¹⁹ DR 328 Attachment 007

²⁰ DR 329

²¹ www.pge.com

- Prior to joining DTE Energy in March 1994, Mr. Earley served in various capacities at Long Island Lighting Company, including President and COO. He was also a partner at the Hunton & Williams law firm.
 - In June 2011, Mr. Nick Stavropoulos was hired as EVP of Gas Operations.²²
 - Prior to joining PG&E, Mr. Stavropoulos served as EVP and COO for National Grid, an electricity and natural gas delivery company serving nearly seven million customers in the Northeast. As COO, he was responsible for all aspects of its U.S. gas distribution business.
 - Prior to that role, Mr. Stavropoulos was President of KeySpan Energy Delivery. Throughout his career, he held a number of senior leadership positions with successive levels of responsibility, including Chief Financial Officer, at Keyspan's predecessor companies - Colonial Gas Company and Boston Gas.
 - Since June 2011, Gas and Electric have held equal positions within the Utility. Also in 2011, Gas Transmission M&C, Gas Distribution M&C and Standards and Policy were consolidated, reporting to Mr. Stavropoulos. In 2012, Investment Planning and a VP Public Safety & Asset Integrity were added to the Gas Organization.
 - Additional personnel with expertise in Gas Operations, including the current SVP, Gas Operations were added to the organization.²³
 - Prior to 2012, there was no executive officer in charge of safety.²⁴ The Corporate Safety Officer until March 1, 2017, started employment with PG&E in 2007. He held positions in Finance, moved to Vice President of Shared Services and then SVP of S&SS.²⁵ He was named Corporate Safety Officer in 2012.²⁶ He had no prior experience managing safety functions.
- 2. The dual-president structure in place for most of NorthStar's review is unique for a combination utility. The structure changed, effective March 1, 2017, when Ms. Williams was elected as CEO of PG&E Corp. and Mr. Stavropoulos was appointed President and COO of the Utility.**
- From 2009 until 2015, the utility operated with one President, Mr. Chris Johns.
 - Upon his retirement in 2015, the presidency was split, with Ms. Williams serving as President, Electric Operations and Mr. Stavropoulos serving as President Gas Operations. They each had responsibility for some service functions which provided support to both electric and gas operations. As an example, customer service reported to Ms. Williams, and IT reported to Mr. Stavropoulos.

²² www.pge.com

²³ www.pge.com

²⁴ DR 003 Attachment 003

²⁵ www.pge.com

²⁶ DR 768

- Effective March 1, 2017, PG&E returned to a single-president structure. The announcement was made in November 2016. A number of high level changes were made before the March 1, 2017, effective date due to the need to obtain Board approvals for some of the personnel changes.

3. Given the significance of San Bruno, the placement of the Corporate Safety function in the Shared Services organization did not provide sufficient emphases on safety.

- **Exhibit IV-6** (page IV-7) provides the corporate safety organization structure in effect as of July 13, 2016. Safety and Health was led by a Senior Director who reported to the VP SH&E, who in turn reported to the SVP of S&SS. The SVP of S&SS reported to the President of Gas Operations.
 - As a result, the first level with operational responsibility for safety was three levels below the President, Gas Operations.
 - The VP, Safety, Health and Environment had eight direct reports.
 - Land Management, Environmental Management and Remediation – also significant functions - reported to this organization.²⁷

4. The Corporate Safety organization has been in a state of flux for years.²⁸

- A Chief or Lead Safety Officer position was not created until 2012.
- From 1997 through early 2010, the corporate safety function was combined with the worker's compensation and claims functions, and led by a Director.²⁹ In 2010, the worker's compensation function moved to Human Resources; the claims function moved to the Law Department; and the safety function moved into a separate department reporting directly to the COO.³⁰
- Following San Bruno, the safety function moved to the Shared Services LOB, which was renamed S&SS in 2012.³¹ Shared Services was led by an EVP with two reporting VPs: VP-Environmental and VP-Supply Chain Management.³²
- The Corporate Safety organization grew in 2012, with the addition of three director positions reporting to a Senior Director of Safety.³³
- On May 1, 2014, the Safety and Environmental team were combined into one SH&E organization.³⁴ Workforce Health was formally moved from Human Resources into the S&SS organization, specifically into SH&E, in October 2015.³⁵ The "Health"

²⁷ DR 001 Supplement 001

²⁸ DR 003, DR 288, DR 813, DR 814, DR 001 Attachment 001 and DR 001 Supplement 001

²⁹ DR 252

³⁰ DR 252

³¹ DR 252, DR 003 Attachments 003 and 004

³² DR 003 Attachment 003

³³ DR 252

³⁴ DR 814

³⁵ DR 813

component of the SH&E organization prior to Workforce Health moving to S&SS referred to industrial health-related work managed by the organization.³⁶

- By the end of 2015, the VP-Environmental position had been renamed to VP-Safety, Health and Environment. The VP-Supply Chain Management remained. The S&SS Organization was expanded, adding a Senior Director-Transportation Services, a Director-Corporate Real Estate, a Director-Environmental Management, Distribution & Shared Services, a Sr. Executive Assistant and three open positions, reporting to the SVP Shared Services.³⁷

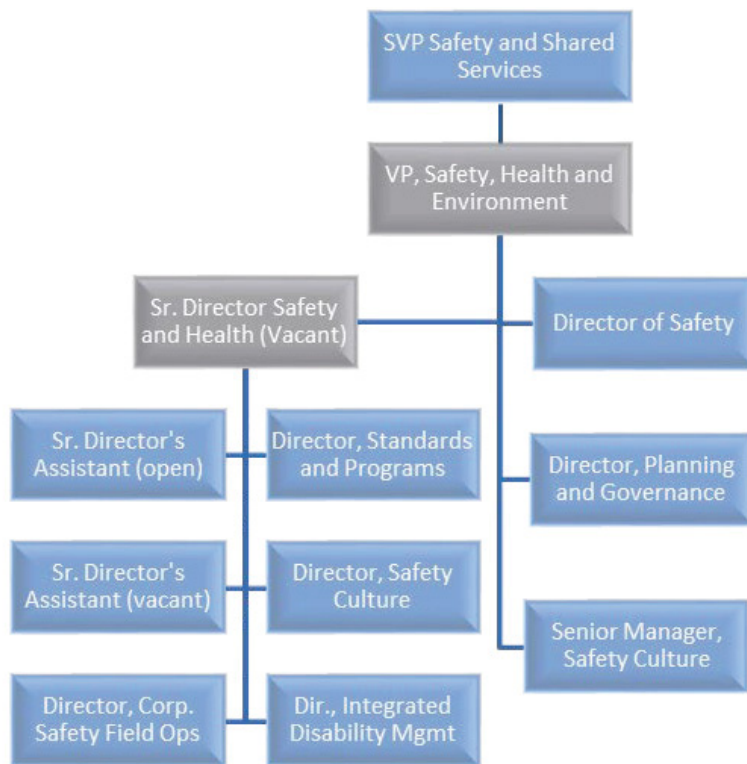
5. The Corporate Safety Organization has been plagued by substantial turnover in middle management ranks (Senior Director and Director). During most of NorthStar's review, key positions remained vacant.

- Substantial turnover of management personnel can contribute to morale issues within the employee base. Some employees report pressure to delivery results quickly, lack of management support, absence of safety credentials in key management positions and the significant demands of the job due to inadequate staffing as contributors to the turnover within corporate safety.
- For the ease of the reader, the Corporate Safety Organization is provided again in **Exhibit IV-9**. Positions to be discussed are shaded in grey. This chart does not show the environmental positions.

³⁶ DR 813

³⁷ DR 001 Attachment 001

Exhibit IV-9
SH&E Organization Structure [Note 1]



Note 1: Organization chart does not show the environmental positions.
 Source: DR 001, Supplement 001.

- Ms. Janet Loduca had been VP, Health and Environment for two years when safety was added to the organization in April 2014. She then served as VP SH&E for 9 months until December 2014. She is an attorney whose prior positions include Regulatory Affairs, Chief of Staff and Corporate Relations.³⁸
- From January 2015 through early 2017, the VP SH&E was previously the VP – Human Resources (March 2011 - December 2014) and the Senior Director Labor Relations (December 2007 – March 2011.) Prior to joining PG&E he was the Senior Counsel for Pennsylvania Power & Light for 20 years.³⁹
- The Senior Director, Safety and Health position, reporting to the VP SH&E, was vacant during most of NorthStar's review. This position is the first level that is primarily responsible for safety and health. As shown in **Exhibit IV-10**, there was significant turnover in this position. Altogether, the position was vacant for almost two years between 2012 and 2016.

³⁸ DR 252

³⁹ IR 4

Exhibit IV-10
Corporate Safety Director Turnover

Tenure	Time in Position	Name	Title	Prior Safety Experience
October 1, 1997 to October 25, 2010	13 years	Employee A	Director-Safety, Health and Claims	√
November 2, 2010 to January 20, 2012	1 year, 3 months	Employee B	Director-Safety, Health and Claims	√
VACANT	3 months	Vacant		
April 23, 2012 to June 22, 2014	2 years, 2 months	Employee C	Sr. Director, Safety	√
VACANT	1 year, 3 months	Vacant		
October 1, 2015 to June 10, 2016	8 months	Employee D	Interim Sr. Director, Safety and Health Previously the Sr. Director, Workforce Health and Productivity from May 17, 2010 to September 30, 2015	Health and Disability
VACANT	5 months	Vacant		
November 2016 - present	4 months	Todd Hohn	Sr. Director, Safety and Health	√

Note: Officers and employees who have been cited in PG&E press releases are named, other employees are not.

Source: IR 71, www.pge.com, DR 252, DR 252 Attachment 001.

- In July 2016, the Corporate Safety Field Operations organization underwent a reorganization intended to provide more effective support to the LOBs.⁴⁰ The LOBs had expressed frustration with the lack of a single point of contact and the value of the services provided by corporate.⁴¹ The organization also suffered from morale issues. As part of the reorganization, existing employees were required to interview for positions in the restructured organization.⁴² As part of the reorganization:
 - Corporate Field Safety Operations established five Business Partners to provide LOB leadership and the grassroots safety teams in each LOB with a single point of contact and to build trust.⁴³ The grassroots safety teams are employee-led teams designed to share information and generate ideas to improve workforce safety. Each LOB may have more than one team. The program was in existence prior to San Bruno.
 - Corporate FSS were now classified as Career, Senior or Expert based on their safety credentials and experience level.⁴⁴ The FSS report to four Corporate Safety Managers – one each for Electric North and South, one for Gas, and one the other LOBs (IT, S&SS, Corporate, Customer Care).⁴⁵ Since the

⁴⁰ DR 370, DR 465, IR 100

⁴¹ IR 237

⁴² IR 237 and other interviews

⁴³ DR 465 various interviews

⁴⁴ IR 237 and organization chart provided during interview.

⁴⁵ Organization Chart provided during IR 237

reorganization, Corporate FSS no longer observe field crews. They observe the LOB Safety Specialists and field Supervisors.⁴⁶

- One Incident Investigation Manager leads four Incident Investigators.⁴⁷ For serious incidents, the Incident Investigators will serve on the investigation team and lead the casual analysis; for non-serious incidents they will provide subject matter expertise and coach the Corporate FSS.⁴⁸

6. Until recently, senior leaders in Corporate Safety had little or no previous experience in utility operations and no direct safety management experience. Overall, individuals responsible for PG&E's various safety functions and organizations lacked "safety" credentials.

- Mr. Des Bell, the Lead Corporate Safety Officer from roughly 2011 through 2016, had no prior experience in utility operations or managing safety functions. He is a former aviation industry expert with change management and process improvement expertise. He had no safety certifications but was a Lean Six Sigma Master Black Belt.⁴⁹ His resume shows no safety experience prior to joining PG&E in 2009 as an SVP and Senior Supply Officer.⁵⁰
- Two individuals have served as VP SH&E since the position was created. Neither individual has direct safety credentials.

7. The roles and responsibilities of corporate field safety vis-a-vis the LOBs have been, and remain ill-defined.

- The operational LOBs, in particular Gas, Electric and Generation, have primary responsibility for safety. NorthStar's interviews with the then-Presidents of Electric Operations and Gas Operations (Ms. Williams and Mr. Savopoulos) confirm that they believe safety responsibility must rest with the LOBs.⁵¹ Ultimately, responsibility rests with each and every employee -- to be accountable for their own safety and the safety of their co-workers and the public.⁵²
- The operational LOBs have safety functions.
 - Gas Safety Excellence is the responsibility of the Enterprise Programs organization which reports to the President, Gas Operations.
 - Electric T&D has a Safety function.⁵³
 - Power Generation has a Safety and Quality Standards organization that is largely focused on safety.⁵⁴

⁴⁶ IR 237

⁴⁷ Organization Chart provided during IR 237

⁴⁸ DR 465 Attachment 001

⁴⁹ DR 787. No press release was issued at the time he was appointed Lead Safety Officer in order for NorthStar to verify dates. DR 252 Attachment 006

⁵⁰ DR 252 Attachment 006

⁵¹ DR 255 and 256 (joint interview)

⁵² Various interviews

⁵³ DR 004 Attachment 001

- As discussed previously, each LOB has FSS.
- In February 2011, the BOD asked PG&E to conduct a culture survey, Zero in on Safety audit and Occupation Health and Safety Systems Assessment. PG&E hired a consultant to assist in these endeavors. The consultant's assessments identified the need to clarify safety roles and responsibilities.
 - Among other findings, the consultant's 2011 report concluded that the safety roles and responsibilities were unclear across the organization.⁵⁵
 - The need to clarify the roles and responsibilities of the Corporate Field Safety Operations team was also identified in the consultant's Safety Culture Assessment completed in 2013.⁵⁶
- In August 2015, the Corporate Safety Department established Service Level Agreements (SLAs) with each of the following LOBs.⁵⁷
 - Customer Care
 - Electric Operations
 - Gas Operations
 - IT
 - Safety & Shared Services
 - DCP.
- In general, the SLAs are intended to clarify the roles of Corporate Safety in "performing audits and assessments (e.g., leading causal analysis and partnering on incident analysis and corrective actions development), ensuring compliance with safety regulations, procedures, and standards, and strategy assistance (e.g., assist with safety communications, coaching and consulting, etc.)"⁵⁸
- SLAs typically define roles and responsibilities, specify key deliverables and set performance standards. The SLAs between Corporate Safety and the LOBs only define roles and responsibilities. Corporate Safety's current SLAs are long, wordy and lack sufficient clarity so as to be meaningful.
- As part of the 2016 restructuring of Corporate Safety Field Operations, the SLAs were reviewed to ensure that roles and responsibilities assigned to the organization aligned with actual skills and resources in the organization. As a result:
 - New SLAs were issued between Corporate Safety and Generation (November 2016), Information Technology, and S&SS (both in October 2016).⁵⁹
 - Revised SLAs between Corporate Safety and the Customer Care, Electric T&D, and Gas Operations organizations have been drafted by Corporate Safety, but not

⁵⁴ DR 004 Attachment 004

⁵⁵ DR 048 Attachment 002 - CONFIDENTIAL

⁵⁶ DR 768 Attachment 001, DR 822

⁵⁷ DR 050 Attachments 003 through 008

⁵⁸ DR 824

⁵⁹ DR 730

yet been agreed upon. In December 2016, these organizations were reviewing the SLAs to ensure that the necessary resources were in place to effectively execute the agreements.⁶⁰

- During numerous interviews, NorthStar found a continued lack of clarity on the relative roles and responsibilities of Corporate Field Operations Safety and the LOBs. This may improve once the reorganization is completed.
- A July 6, 2016, email from the VP, Safety, Health and Environment announcing the change in the Corporate Field Safety Operations structure described the challenges:⁶¹

We have received feedback about the consistency and quality of the support the Corporate Safety team has been providing to LOBs. The feedback has been direct and instructive. If we want to be your trusted partner in safety, we need to address the areas in which we are falling short.

A foundational part of any support model is its organizational structure: Knowing who to turn to for specific information, having clear end-to-end processes, establishing clear roles and responsibilities. This is an area we have spent considerable time refining—in consultation with your teams and through benchmarking—to provide the most value to the company. What is clear is that we needed to redesign the Corporate Safety team and its roles to ensure LOBs receive end-to-end support, from culture and planning to job site safety and investigations.

8. All though it is too early to determine true effectiveness, the recent changes in PG&E’s overall organization structure should improve the effectiveness of Corporate Safety and positively contribute to the “One PG&E” culture.

- The two-president model has been eliminated, minimizing the need for “One PG&E” branding to mitigate the perception created by dual presidents.
- The newly appointed President of PG&E has a strong safety focus and has been instrumental in driving change within Gas Operations. He now has responsibility for all utility operations. Given his extensive background in Gas Operations, this should prevent a recurrence of any “big E, little G” mentality.
- Corporate Safety now reports directly to the President of PG&E with a direct reporting relationship to the NOS Committee as recommended by NorthStar in discussions with executive management during the course of NorthStar’s review.
- A new lead safety officer with operational experience was selected as part of the organizational change. Although not specifically safety-credentialed, Mr. John

⁶⁰ DR 730

⁶¹ DR 463 Attachment 001

Higgins, the new Lead Safety Officer has a strong operational background and apparent passion for safety. He is supported by Mr. Todd Hohn, a newly hired Senior Director of Safety and Health who, while not a utility expert, has strong safety credentials.

- John Higgins joined PG&E in 2012 as Senior Director, Field Operations in PG&E's gas organization. Prior to joining PG&E, Higgins was the Director, Field Operations and Construction, at Massachusetts-based National Grid US. He was responsible for gas operations across three states, as well as multiple regulatory jurisdictions and several labor unions. He held a leadership role focused on improving field safety performance and reducing third-party damages. Prior to this role, Higgins held various roles of increasing responsibility spanning construction, maintenance, resource planning, gas production and project engineering at several New England utilities. Higgins holds a bachelor's degree in chemical engineering and a master's degree in business administration from the University of Massachusetts, and is a graduate of the Greater Boston Executive Program at Massachusetts Institute of Technology (MIT).⁶²
 - Todd Hohn joined PG&E in November 2016, as Sr. Director, Safety and Health, responsible for integrated disability management, field safety, safety programs and safety culture efforts that support employees and contractors. He has 25 years' experience in developing and implementing workplace safety and health programs. Most recently, he served as Global Director of Workplace Health and Safety for Underwriters Laboratory Inc. Prior to that he was Assistant VP of Risk Control for CNA Insurance. He is a Certified Safety Professional and has a broad range of safety and health industry affiliations.
 - NorthStar's initial interviews with Mr. Higgins before and after his appointment as Lead Safety Officer, evidence a focus on safety, an analytical approach to addressing safety issues and an operational credibility that the previous Lead Safety Officer lacked. Mr. Higgins also requested an interview with NorthStar to discuss NorthStar's concerns and recommendations for improvements.
 - NorthStar also met with both Mr. Higgins and Mr. Hohn who were in the process of developing a safety strategy and found them to be engaged and interested in changing the culture at PG&E.
- 9. It does not appear that the spans and layers program was effective in bridging the gap between executives and the field organizations. It is too early to determine if the 2017 organizational changes will bridge the gap.**
- In response to concerns regarding the distance between management personnel setting policies and the employees performing the work, PG&E undertook a review of its existing organizational structure and staffing. As part of the study, PG&E reviewed employee feedback, evaluated changes in leadership levels and benchmarked PG&E's structure against other high performing companies. In an August 2016, presentation,

⁶² http://www.pgecorp.com/aboutus/our_team/JCHiggins.shtml

“A Case for Change,” PG&E provided the following relevant comments based on employee surveys:⁶³

- “Nobody is in charge of cross-functional processes and issue resolution. As a result, [it] is unclear who makes decisions, or what level of management is responsible for what type of decision”.
 - 94% of leaders across the company indicated that we spend too much time coordinating, vetting and getting sign-off in order to make decisions.
 - Almost 20% of people leaders have 3 or fewer direct reports.
 - “There are just too many management layers. In my organization, there are 6 layers...”
 - “When you have one person doing something and requires 3 to 4 levels of review, there is significant rework”
- According to the presentation, leadership positions increased each year from 2010 through 2014, and began decreasing in 2015 and 2016 as a result of the program. The number of leader with zero to three direct reports decreased 179 positions from July 2015 to August 2016.⁶⁴
 - On July 12, 2016, PG&E published a Corporate Standard regarding spans and layers. The standard is intended to streamline the organizational structure and improve overall effectiveness by minimizing the layers of management needed to meet business objectives, while outlining a consistent process for setting the span of control for every Leadership Track role.⁶⁵
 - PG&E will maintain an in-layer maximum of 10 layers, from CEO to front-line employees.
 - Based upon the classification, leadership suggested ranges included: 4-7, 8-10, 11-15 and 16-20. Special circumstances were required for spans greater than 20. An additional procedure exists to assist leaders in determining which span range they are in.⁶⁶
 - Teams with bargaining unit foremen or sub-foremen who are not identified as Leadership Track employees are classified as special circumstances. See Chapter V for additional discussion on field spans of control.
 - Overall, PG&E eliminated about 6 percent of management positions as a result of the spans and layers program. As part of the spans and layers program, each LOB determined the targeted number of positions to be eliminated, considering the needs

⁶³ DR 526 Attachment 001

⁶⁴ NorthStar has not validated these claims. As, generally field organizations are not intended to be included in the broad span ranges determined by the program (DR 526), and NorthStar was informed the program results may be skewed (DR 741).

⁶⁵ DR 458 Attachment 001

⁶⁶ DR 459 Attachment 002

of their organization and the standards of the program.⁶⁷ The results of the LOBs' review of management positions are summarized in **Exhibit IV-11**.

Exhibit IV-11
Management Positions to be Eliminated

Line of Business	Leaders (as of 7/6/2015)	Targeted Reduction by 1/9/17	Percent
Electric T&D (1)	747	33	4.4%
Power Generation (1)	371	32	8.6%
Energy Procurement	68	5	7.4%
Gas Operations	621	32	5.2%
Customer Care (1)(2)	401	17	4.2%
Safety and Shared Services (1)	262	12	4.6%
Information Technology (1)	264	12	4.5%
Finance and Risk (1)	135	16	11.9%
Human Resources (1)	79	5	6.3%
General Counsel	28	2	7.1%
Regulatory Affairs	41	3	7.3%
External Affairs	58	7	12.1%
CEO/COO/President (3)	11		0.0%
President (3)	2		0.0%
Total	3,088	176	5.7%

Notes on leaders excluded from Leaders with Spans < 4:

(1) 22 leaders with non-employee workers, based on a proposed change to the standard to count staff augmentation non-employee workers on a 4:1 ratio.

(2) 60 call center supervisors.

(3) 5 leaders for newly created Ethics & Compliance and Strategy organizations, and 2 leaders associated with the CEO and Presidents offices.

Source: DR 458 Attachment 001.

- Generally, field organizations were not intended to be included in the broad span ranges identified by the program. "In cases where there are foremen and sub-foremen available, the supervisor may have a higher number of direct reports because the foremen and sub-foremen provide much of the day-to-day oversight of work."⁶⁸ See further discussion in **Chapter V: Field Operations**.
- While the program may have eliminated a few layers with a limited number of leaders, it does not appear to have truly flattened the organization.⁶⁹
- As part of the 2017 reorganization, PG&E plans to reduce the number of officers by 15 percent, or eight positions, resulting in a flatter, more nimble, decision-making structure.⁷⁰ Due to the timing of the reorganization, NorthStar is not able to

⁶⁷ DR 458

⁶⁸ DR 526

⁶⁹ NorthStar Analysis, DR 526 Attachment 2

⁷⁰ https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20170111_pge_streamlining_management_implementing_efficiency_measures_to_keep_customer_bills_affordable_while_investing_in_the_future

determine its true effectiveness in improving decision-making and reducing bureaucracy.

D. RECOMMENDATIONS

1. Appoint a Corporate Safety Officer who has both operations and professional safety experience. NorthStar is aware that Mr. Higgins replaced Mr. Bell as Corporate Safety Officer on March 1, 2017. While Mr. Higgins has operating experience with National Grid, PG&E and other utilities, he does not have professional safety training or experience. Mr. Higgins should undertake a professional training program that will provide him with the necessary skills as soon as possible.
 - At a minimum, Mr. Higgins should complete the same nuclear power management course taken by Mr. Stavropoulos and Ms. Williams that is intended for senior executives who have responsibility for a nuclear plant but no nuclear operational training.
 - PG&E should consult with the following to determine what additional training is appropriate: selected large company (utility, pipeline, aviation, chemical/refining) safety officers, the American Gas Association (AGA), the Edison Electric Institute (EEI), the NTSB, and the Federal Aviation Administration (FAA).
 - In addition to the top officer, information on requirements for staff safety specialists should also be gathered.
2. The Corporate Safety Officer should report to the COO of the Utility and to the NOS Committee of the Board in the same manner that the head of Internal Audit reports to the Audit Committee of the Board in most public companies. (It is NorthStar's understanding that this has been implemented.)
3. Examine workload levels, potential morale issues and other demands to understand and mitigate the reasons for the high turn-over at the Sr. Director, Safety and Health position and throughout the Corporate Safety organization.
4. Following the development of the safety strategy review the structure, reporting relationships and staffing levels of the Corporate Safety organization to ensure PG&E has the resources necessary for strategy execution and proper coordination with/support for the LOBs.
5. Improve the safety credentials of personnel in PG&E's safety functions and organizations.
6. Simplify and clarify the roles and responsibilities of the Corporate FSS vis-à-vis the LOB FSS to eliminate duplication, and align activities with the respective skill sets. Work with the LOBs to determine service levels and staffing requirements.

7. Establish, and adhere to, minimum qualifications for Corporate and LOB FSS. Establish training requirements for LOB FSS to ensure they are up to date on current methods and procedures and have a working knowledge of key regulatory requirements.

CHAPTER V: FIELD OPERATIONS

This chapter provides the results of NorthStar's review of PG&E's field operations in terms of observed safety practices and working knowledge of the Company's safety initiatives, policies and procedures. It also includes a discussion of the initiatives undertaken by Electric T&D, Power Generation and Gas Operations.

A. BACKGROUND

PG&E field operations are performed by three primary LOBs, each reporting to a Senior Vice President:

- Electric T&D
- Gas Operations
- Power Generation.

Each LOB operates in an unforgiving work environment with inherent risks, such as: transporting a flammable substance under pressure, handling live electric circuits, working at heights, working in confined spaces, working with rotating equipment and driving a significant number of miles. Following San Bruno, each LOB undertook a number of initiatives designed to improve asset, public and employee safety.

Electric Transmission & Distribution

On September 15, 2011, Electric T&D completed its first Electric Operations Improvement Plan following San Bruno. The plan involved multiple work streams addressing the following, and also included a proposed organization redesign.¹

- Public/System Safety
- Employee Safety
- Compliance
- Customer Satisfaction
- Reliability
- Work Efficiency
- Technology

Gas Operations

Following San Bruno, Gas Operations' primary focus was on ensuring the safe and reliable operations of its gas system. In June 2011, the CPUC required all California gas operators to develop a plan to strength test or replace all transmission pipelines without complete, verifiable and traceable records, and to verify that existing test records met new, more rigorous standards. Utilities were also instructed to expand the use of in-line inspection

¹ DR 505 Attachment 001

tools and automated gas shutoff valves.² On August 26, 2011, PG&E filed its multi-year pipeline modernization plan, the Pipeline Safety Enhancement Plan (PSEP), which was designed to apply new, stricter standards to older pipelines and enhance safety across the entire gas transmission system.³ PG&E expected to receive approval in December 2011.⁴ The Plan was approved by the CPUC on December 20, 2012.⁵ Under the PSEP, PG&E is performing a comprehensive assessment of all 5,768 miles of its natural gas transmission pipelines. As filed, PSEP is a long-term plan with four complementary work streams: 1) pipeline modernization; 2) valve automation; 3) pipeline records integration; and, 4) interim safety measures. **Exhibit V-1** provides the PSEP timeline and focus areas as filed.

Exhibit V-1 PSEP Timeline

	Phase 1	Phase 2
Timeframe	2011 - 2014	2015 - 2025 (proposed)
Focus Areas	High-priority areas, including: <ul style="list-style-type: none"> • Pipelines without strength test records • Those potentially having manufacturing-related threats 	All other areas: <ul style="list-style-type: none"> • Non-strength tested urban pipelines without manufacturing threats operating below 30% Specified Minimum Yield Strength • Previously strength tested pipe • All Class 1 rural pipelines
Forecasted Results	<ul style="list-style-type: none"> • Replace 185 miles of pipeline • Strength test 783 miles of transmission pipeline • Retrofit 199 miles of transmission pipeline to accommodate in-line inspection tools • Conduct in-line inspections on 234 miles of transmission pipeline • Automate 228 valves in densely populated areas 	<ul style="list-style-type: none"> • Replace 250 to 500 miles • Strength test 1,700 miles • Conduct in-line inspection upgrades on 2,800 miles • Close-Internal Survey of External Corrosion Direct Assessment: 1,030 miles • Complete assessment of all 5,786 miles of natural gas transmission pipeline

Source: DR 066, Supplement 001, Attachment 15.

In late 2011, in an email to the extended Gas Operations Leadership Team, PG&E Gas Operations laid out its top 10 Gas Operations priorities, based on input and data gathered from internal and external sources, observations, and the study of industry best practices:⁶

1. Build a culture that puts public and personal safety first
2. Establish a clear organizational structure
3. Engage workforce and recruit talent
4. Rebuild integrity management process
5. Develop accurate asset knowledge
6. Achieve full regulatory compliance (rebuild trust)
7. Create and implement consistent standards, work methods and procedures

² DR 066, Supplement 001, Attachment 015

³ Previously known as Pipeline 2020. DR 066, Supplement 001, Attachments 012 and 014

⁴ DR 066, Supplement 001, Attachment 015

⁵ DR 066, Supplement 001, Attachment 012

⁶ DR 066, Supplement 001, Attachment 003

8. Establish an investment planning function
9. Improve gas transmission system control and build distribution control system
10. Revamp Quality Assurance/Quality Control capability.

On June 29, 2012, PG&E submitted its Gas Safety Plan to the CPUC. All California gas utilities were required to file gas safety plans as a result of Senate Bill 705, which was signed by Governor Jerry Brown in October 2011.⁷

PG&E considers the Gas Safety Excellence (GSE) strategic framework its approach to help the company achieve its vision of becoming the safest, most reliable gas company in the United States. “It guides how we operate, conduct and manage all parts of the business. We do this by understanding the condition of our assets and potential risks, and putting a plan in place to reduce those risks.”⁸ The GSE embodies three core elements:⁹

- **Asset management.** Knowing the condition of its assets and having a robust plan to manage those assets based on accurate information and understanding and managing risks to those assets.
- **Safety Culture.** Embracing and encouraging open, honest communication among employees and leaders, and the alignment of human performance with organizational strategy.
- **Process Safety.** A comprehensive series of processes and procedures that serve as controls, preventing large-scale operational failures and associated risks.

Power Generation

Power Generation developed a Hydro Asset Management plan that included safety-related initiatives in 2011.¹⁰

NorthStar Field Observations

As part of the review of Field Operations, NorthStar, in collaboration with SED, developed a representative cross-section of PG&E Gas Operations, Electric T&D and Power Generation operations (regions/divisions/service centers/power plants) to structure site visits and directly observe whether safety-related policies and procedures were being uniformly followed. The selected site visits covered geographical/organizational areas, large and small work groups, maintenance and construction activities, the transmission and distribution system, substations and generating assets. As part of this effort, NorthStar:

- Conducted site visits to Diablo Canyon, Feather River power houses and control centers, Clayton Fire Base Camp (Lower Lake) restoration operations, and nineteen field offices (San Francisco, Daly City, Oakland, Hayward, Sonoma, Chico, San Luis

⁷ DR 066, Supplement 001, Attachment 011

⁸ DR 178 Attachment 5

⁹ DR 178 Attachment 7

¹⁰ DR 503 Attachments 001-004

Obispo, Santa Maria, Pismo Beach, Fresno, Auburn, King City, Monterey, Salinas, Antioch, Manteca, Stockton, Needles, and Hinkley).

- Observed PG&E and contractor crews performing generation, electric and gas – transmission, distribution, substations, maintenance and construction, general construction and vegetation management. Visits included interviews with crew members, supervisors, Grass Roots personnel and LOB FSS.
- Attended field visits performed by the SVP, Gas Operations and the SVP, Electric Operations.
- Conducted ride-alongs with electric troubleshooters and gas leak emergency responders.
- Interviewed field crews and supervisor personnel regarding:
 - Changes in safety activities and timing
 - Training
 - Role of safety specialists
 - Existence of necessary tools to support field operations
 - Safety “culture”
 - Supervisory and management presence in the field
 - Policies and procedures
 - Incident reporting
 - Recognition programs
 - Disciplinary process and timing of changes
 - Safety suggestions and process improvements
 - Frequency of, and ability to, process changes
 - Ability to stop work and comfort level doing so
 - Frequency of safety-related work stoppages
 - Effectiveness of the disciplinary process in terms promoting a positive safety culture.

B. EVALUATIVE CRITERIA

- Is there uniform understanding of the Company’s safety goals and objectives?
- Does PG&E’s safety culture – as presented by executive management during the orientation sessions – reach all the way to each operating region, district, service center and work crew?
- Does PG&E’s safety culture effectively link executive management and field operations; between individuals, crews and their work methods; between utility services, regions, divisions and subdivisions; and between processes, functions, and overarching safety goals?
- Is there compliance within the organization(s) regarding safety requirements, recognition and consequences or accountability for deviating or performing at, above, or below standards of compliance?

- Has there been continuous reassessment of hazards, reevaluation of norms and practices and has there been meaningful actions taken within operations of the Company to improve occupational and public safety?

C. FINDINGS & CONCLUSIONS

1. There is no uniform understanding of the Company's safety goals and objectives in LOB field operations, largely because there is limited uniformity across the corporate landscape.

- The greatest culture difference exists between PG&E “corporate” and that of the various Gas, Electric, and Power Generation field workforces.
 - Over half of PG&E's 23,000 employees work in the three primary LOBs (14,700 as noted in **Chapter II: Background**), yet very few participate in the corporate integrated planning process or the development of the “goals and strategies”.¹¹
 - Many of the safety-related initiatives are conceived and developed at the corporate level and then directed to the LOB field operations for implementation.
- PG&E's Gas Operations, Electric T&D, and Power Generation (including nuclear) LOBs operate separately, frequently in geographically diverse locations.¹² Based on NorthStar field observations, the Service Centers and power plants within the various LOBs operate differently from each other even within an LOB.¹³
- There are distinct culture differences between the three LOBs.
 - PG&E's three operational LOBs perform different work and report to different locations within the service area.
 - In many cases Service Center locations are common to both Gas Operations and Electric T&D field crews. Managerially they are separate and operationally they utilize separate areas within the facility.
- Responses to the 2014 and 2016 Premier surveys reflect employee concerns regarding the lack of management direction as shown in **Exhibit V-2**. Nearly half of the survey respondents appear to have some level of dissatisfaction with management's clear direction, application of best practices, and collaboration among different departments.

¹¹ DR 004

¹² DR 004

¹³ IR list field visits

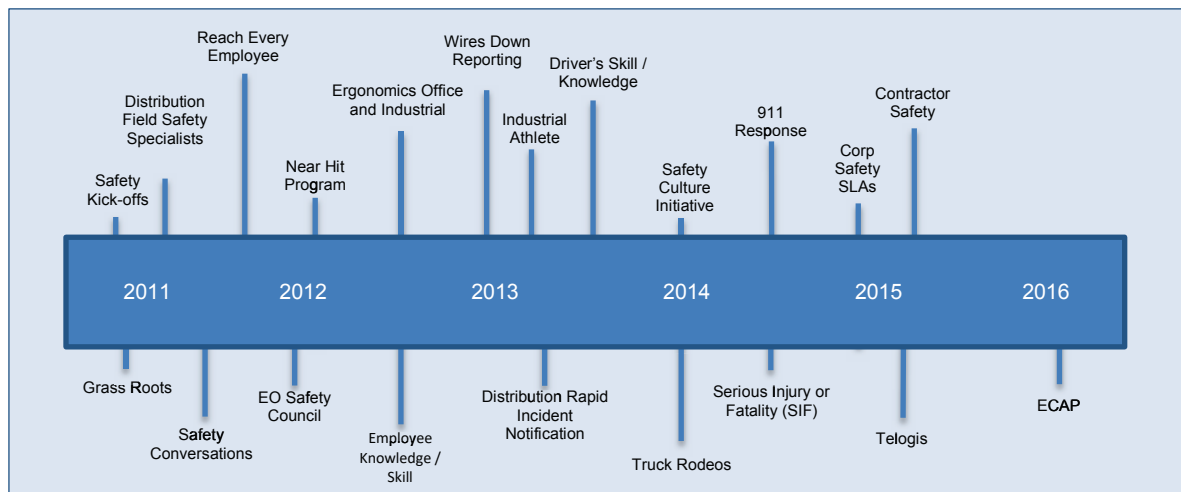
Exhibit V-2 Premier Survey Results

	2014	2016
Communication		
1. PG&E has tools in place that enable employees to easily share information.	68%	66%
2. How satisfied are you with the information you receive from management on what's going on at PG&E?	59%	60%
3. Officers and Directors provide a clear direction for PG&E.		58%
Continuous Improvement		
4. The people I work with cooperate to get the job done.	84%	86%
5. Officers and Directors actively support applying best practices across different areas of the business.	51%	59%
6. I see people in different departments and groups collaborating with one another.	62%	57%

Source: DR 662, Attachment 001.

- PG&E executive management's orientation safety culture presentations covered significant initiatives undertaken since San Bruno to improve safety culture and are illustrated in **Exhibits V-3, V-4 and V-5**.
- Electric T&D safety initiatives presented to NorthStar concentrate on occupational safety, emergency response and employee skills as shown in **Exhibit V-3** below.

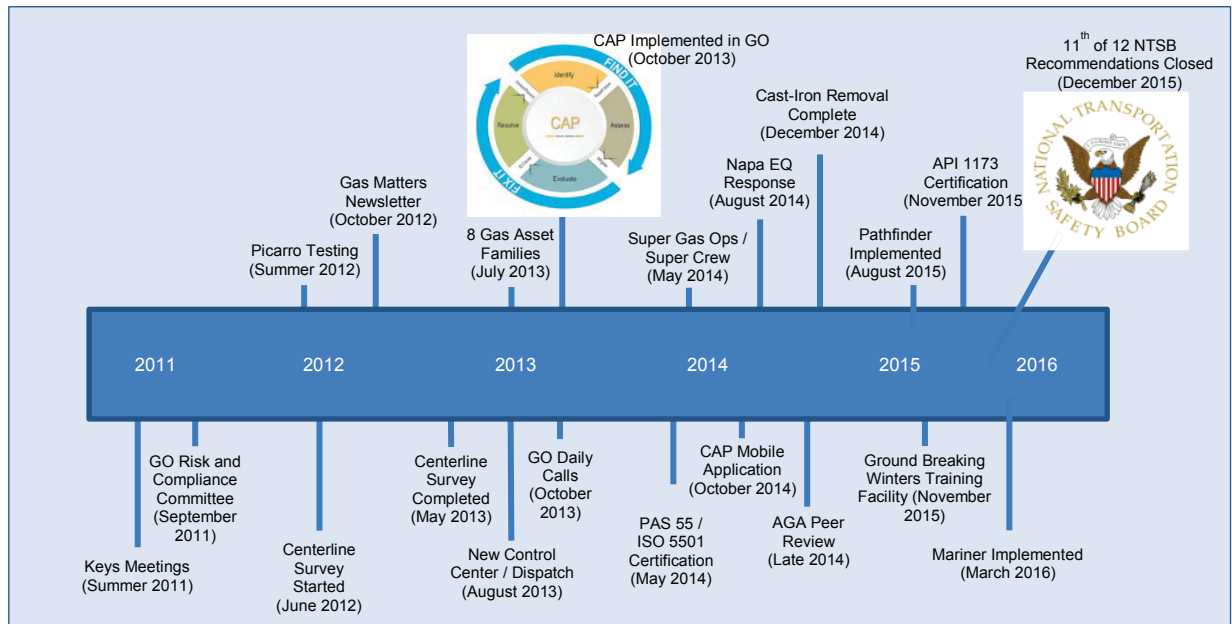
Exhibit V-3 Electric T&D Safety Highlights (2011- 2016)



Source: DR 004, Attachment 002.

- Gas Operations' safety initiatives differ from those of Electric T&D and focus on pipeline, corrective action and certifications as shown in **Exhibit V-4**.

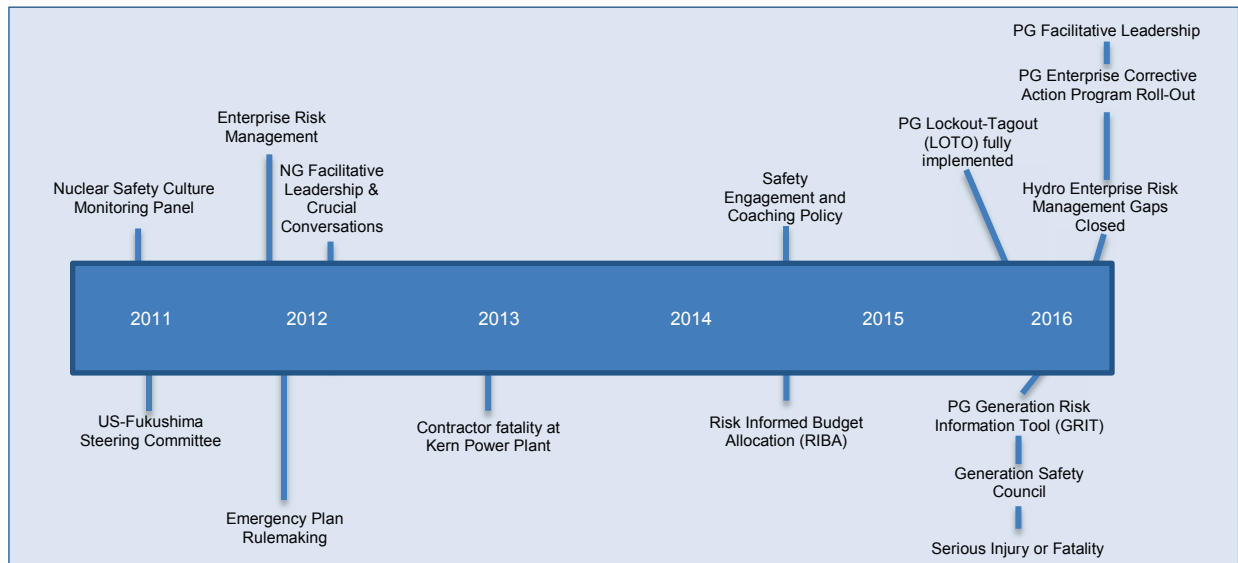
Exhibit V-4 Gas Operations Safety Highlights (2011 – 2016)



Source: DR 004, Attachment 003.

- Power Generation’s safety-related initiatives presented to NorthStar are dissimilar to both Electric T&D and Gas Operations. Generation safety-related highlights focus on incident identification, analysis, coaching and safe equipment isolation (“lock out and tag out”) as shown in **Exhibit V-5**. Lock out-tag out (LOTO) is a safety procedures designed to ensure that dangerous machines are properly shut off and not started up again prior to the completion of maintenance or servicing work.

Exhibit V-5 Generation Safety-Related Highlights (2011 – 2016)



Source: DR 004, Attachment 005

- Only two “Safety Highlights” as presented to NorthStar appear to be common to all three LOBs: the GrassRoots safety teams which began prior to San Bruno, and implementation of the enterprise-wide Corrective Action Program (CAP) in 2016. CAP is described in greater detail in **Chapter X: Safety Reporting/Corrective Action**.

2. Safety Improvement Plans developed within each of the PG&E LOBs are insular.

- As previously described in the Background Section, since San Bruno, PG&E LOBs have produced a number of safety plans: one each from Electric T&D and Power Generation, and a number of annual plans by Gas Operations.
- These safety-related improvement plans do not coordinate safety initiatives among the LOBs or provide a uniform corporate focus on safety.
- Gas Operations plans address “safety culture” but the Electric T&D plan and the Power Generation plan do not address safety culture.
- Gas Operations safety-related plans include the following:
 - A Natural Gas Transmission Pipeline Replacement of Testing Implementation Plan was filed on August 26, 2011, with the CPUC.¹⁴ This plan included:
 - Pipeline Pressure Testing
 - Pipeline Replacement

¹⁴ The plan filed on August 26, 2011 is located at:
<http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=4594>.

- Valve Automation
 - Pipeline Records
 - Safety Enhancement Measures
- A Gas Turnaround Plan was developed October 26, 2011.¹⁵ This plan concentrated on business processes, organization, performance assessment, schedule and governance.
 - In the fourth quarter of 2011, the Gas Operations Executive Vice President began convening his officers and directors in a monthly meeting referred to as the “Keys to Success” or Keys meeting.
 - The purpose of these meetings was to establish goals, communicate expectations, report progress on initiatives/metrics, and discuss the path forward for Gas Operations. A focal point of this meeting was the implementation of the Gas Operations Turnaround Plan. The first monthly meeting was held in October of 2011.¹⁶
 - Pursuant to PUC Code Sections 961 and 963, and CPUC D.12-04-010, PG&E submitted its first Gas Safety Plan to the Commission on June 29, 2012, with annual updates (provided up to 2016).¹⁷
 - Electric T&D developed an Electric Operations Improvement Plan that included safety-related initiatives on September 15, 2011.¹⁸
 - Areas identified for improvement in this plan were based on the IRP report and included: public/system safety, employee safety, compliance, customer satisfaction, reliability, work efficiency, and technology.
 - Leaders in the Electric T&D organization were assigned to lead each improvement area and provided approximately three months to develop improvement plans. The first meeting was held in January 2012 and continued through mid-2014 at which point PG&E stated that these efforts were incorporated into PG&E’s annual integrated planning process, as necessary.¹⁹
 - Power Generation developed a Hydro Asset Management plan that included safety-related initiatives in 2011.²⁰
 - Over the same post-San Bruno timeframe that the LOBs were developing safety improvement plans, PG&E was developing a corporate planning process. The (corporate) integrated planning process was introduced at PG&E in 2012, and has

¹⁵ DR 773 Attachment 001

¹⁶ DR 775

¹⁷ DR 013, and DR 347

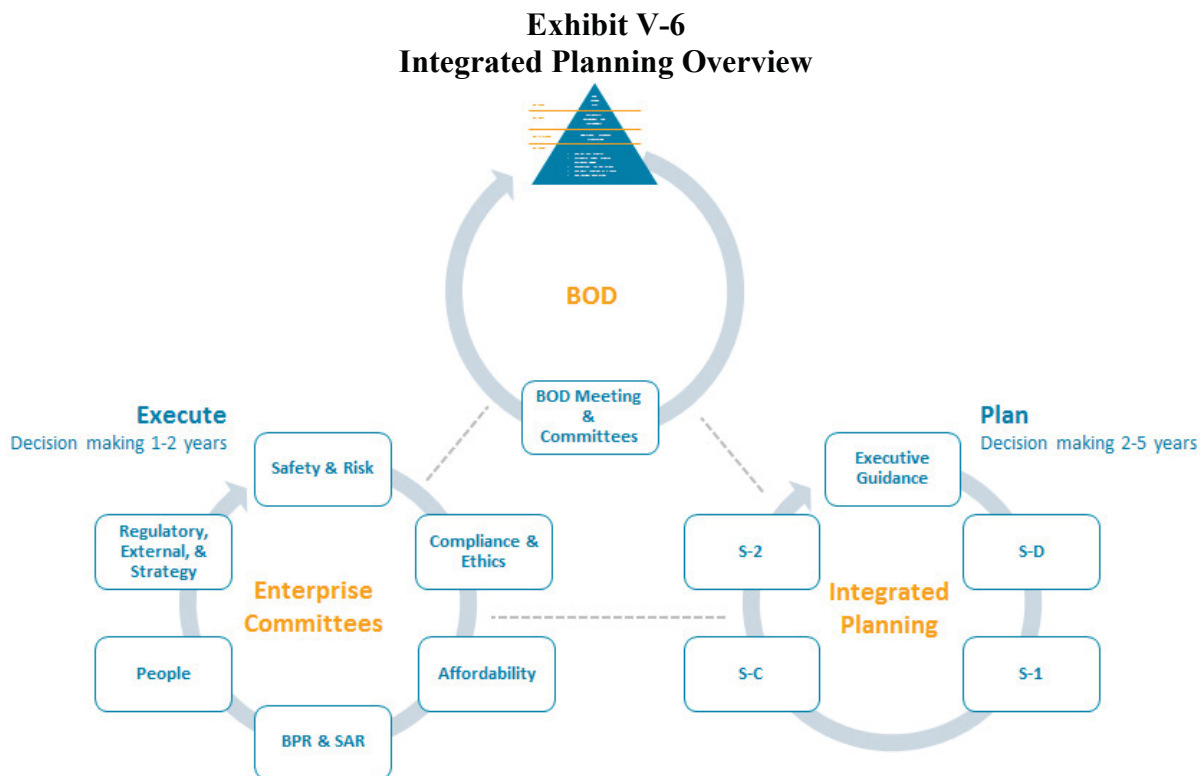
¹⁸ DR 505 and 775

¹⁹ DR 775

²⁰ DR 503 Attachments 001-004

evolved during the same timeframe as LOB safety plans noted above.²¹ The process is addressed in **Chapter VI: Budgeting and Spending**, and major elements include:

- **January – Executive Guidance** establishes PG&E’s goals over the next five years.
 - **April – Session D (S-D)** identifies key risks and compliance issues for the business and for each LOB.
 - **July – Session 1 (S-1)** outlines each LOB five-year goals and strategies to achieve them.
 - **August – Session C (S-C)** establishes succession plans for company leadership.
 - **November – Session 2 (S-2)** translates S-1 goals and action items from Session C and Session D into a two-year work plan, resource plan, and budget.
- The earliest IPP product is mid-2012 and the process is illustrated in **Exhibit V-6**.²²



Source: DR 004 Attachment 003.

- PG&E stated that the Company’s safety plan is reflected in the Company’s S-1 plans updated on an annual basis. S-1 outlines each LOB’s goals and strategies over a 5-year time horizon, including key programs for achieving PG&E’s safety goals.

²¹ DRs 039, 040, 205

²² DR 004 Attachment 003

PG&E's safety culture initiatives are a component of the safety plans contained within the S-1s.²³

- Documentation of safety culture improvement planning was included in the IPP dated June 7, 2013.²⁴ There are numerous separate LOB packages within the IPP each year, including each of the three primary LOBs. The individual S-1 LOB packages are not transferred into a composite S-1.
- The Gas Operations IPP S-1 package is entirely different than the annual Gas Safety Plan documents described previously.²⁵

3. While the NOS Committee has elevated PG&E's safety culture awareness at senior management levels, focusing and prioritizing management's attention it has limited direct effect on field operations.

- The PG&E BOD created the NOS Committee on December 6, 2011, fourteen months after San Bruno and six months after the IRP Report.²⁶ The NOS Committee is normally attended by all BOD members and PG&E executives. NorthStar observed a NOS Committee meeting in late 2016, which focused on the Company's progress in improving employee safety incident reporting.²⁷ Highlights included the following:
 - Timely reporting of injuries has increased from 61 percent in 2015 to 66.6 percent YTD 2016. The last three months have set company records for timeliness and total call volumes have increased 20 percent annually.
 - Near-Hit reporting is increasing.
 - Electric T&D Driver Check complaints are decreasing.
 - The nature and severity of injuries are improving.
 - Safety performance has recently plateaued for some metrics.
- There has been a steady rise in lost workday (LWD) and OSHA recordable rates since the implementation of the modified discipline policy as it pertains to safety in 2011. Those increases have leveled off in the last two years.
- LWDs have been primarily sprain/strain or musculoskeletal injuries (63 percent YTD 2016, 72 percent 2015), as opposed to serious injuries.
- PG&E is currently forecasting a slight decrease in the number and rate of Serious Preventable Motor Vehicle Incidents (SPMVI) for 2016 compared to 2015.
- Half of the eligible fleet will be outfitted with Telogis (vehicle monitoring) by the end of the year and PG&E is planning to be at 75 percent at the end of 2017.²⁸ Telogis tracks driving behavior and provides safe driving metrics. As

²³ DR 211

²⁴ DR 039

²⁵ DRs 013, 039, 211, 347, and 773

²⁶ DR 006-CONFIDENTIAL, 008 and *Report of the Independent Review Panel – San Bruno Explosion – Prepared for the California Public Utilities Commission*, June 24, 2011

²⁷ DR 006-CONFIDENTIAL and 008

²⁸ DR 006-CONFIDENTIAL and 008

implemented at PG&E, it provides in-cab alerts when a driver has exceeded 80 miles per hour or 10 miles per hour over posted speed limits, and for instances of hard breaking or hard acceleration.²⁹

4. As a result of frequent safety newsletters and safety-related communications, field personnel have an increasing awareness of safety as a corporate priority.

- PG&E disseminates many safety-related written materials, signs, posters and placards related to safety and safe work practices. The Company's communication program covering safety is covered in **Chapter IX: Communications**.³⁰
- PG&E field personnel are generally aware of PG&E's intent and recent success in moving towards a positive safety culture. Employees interviewed were generally aware of increased attention to safety, but uncertain of specific safety goals and objectives.³¹
- Additionally, many field personnel stated that PG&E executive management prioritizes safety when considering overall service delivery – including performance, output, efficiency and effectiveness.³²
- A common theme among field operations personnel was how dramatically the corporate attitude has shifted in just the last two-to-four years. In general, staff consistently acknowledged that safety has become more of a company priority and many believe the attention being given is appropriate.
- The cultural change most often cited was changing from the previous “positive discipline” practice to the current “non-punitive, speak-up” reporting approach.³³ For many years PG&E relied on incident-based disciplinary actions to deter unsafe behaviors and reconfigured its discipline practices to a behavior-based discipline. In practice, the original discipline practices were considered by many to be overly harsh and too often resulted in employee termination.³⁴
 - An August 2011, PG&E leadership assessment report found that PG&E relied too much on discipline, and that the administration of discipline drove reporting down, diminished learning opportunities, and misled employees into thinking that leadership's primary objective is to find fault and place blame.³⁵
 - In May 2012, PG&E changed its discipline policy to remove the use of discipline in response to safety incidents, except under very limited circumstances. PG&E's non-punitive policy related to reporting of safety incidents/issues was designed to encourage raising issues so they can be addressed.³⁶

²⁹ DR 060 Attachment 002

³⁰ Various field observations and interviews.

³¹ Various field observations and interviews.

³² Various field observations and interviews.

³³ Various field observations and interviews.

³⁴ DR 025 Attachment 001 and various field observations and interviews.

³⁵ DR 048 Attachment 001

³⁶ DR 004 Supplement 001 Attachment 002, page 30

- PG&E's new policy uses discipline following safety incidents or accidents only as a last resort.³⁷ In order to remove any perception of punitive action, PG&E no longer used the term "coaching" in these instances and instead defined the discussion between an employee involved in a safety incident and their supervisor, a "Safety Discussion".³⁸ A policy guideline was developed for planning such a discussion. Highlights of the "Safety Discussion" guideline include:
 - The leader should set the stage with a professional and personal tone and tenor, and put the employee at ease by being prepared and thoughtful about the interaction.
 - A safety discussion is intended to debrief an incident or event where the incident analysis has concluded no positive discipline is warranted and a "safety discussion" is the correct course of action.
 - Make clear right away that the incident analysis is completed, that the findings suggest (human error, simple mistake, etc.) and you won't be issuing any discipline consistent with our approach to Safety.
 - Facilitate an interactive discussion to review the findings of the organizational and/or employee causes (human error or simple mistake) identified in the incident analysis, and explore ways to prevent similar incidents in the future.
 - The effects of the changes made in the discipline policy as well as efforts to promote injury reporting began to show as numbers of *reported* injuries, LWD cases, and Motor Vehicle Incidents (MVIs) increased from 2011 to 2012.³⁹ Total LWDs declined despite the same number of injury claims received, suggesting that the nature of the injuries was becoming less severe. In fact, despite an increase in reported preventable MVI rates, the rate of *serious* preventable MVIs decreased from 2011 to 2012. Also, near hit reporting doubled from 2011 to 2012.⁴⁰
 - During the 2011-2012 General Negotiations with IBEW Local No. 1245, PG&E agreed to explore modification of the application of Positive Discipline to safety incidents. The revised policy was formalized in a letter to the Union on January 28, 2013.⁴¹
 - Field interviews with crew members confirmed that the Company has moved away from its historically strict disciplinary policies and procedures to a more counseling approach.⁴²
- 5. The safety culture presented by PG&E's executive management has achieved limited organizational depth at the various stations, service centers, and work crews.**

³⁷ DR 025, Attachment 002

³⁸ DR 025, Attachment 002

³⁹ DR 768 P18 line 4

⁴⁰ DR 726

⁴¹ DR 027

⁴² Various field observations and interviews.

- PG&E does not appear to gather the necessary information nor conduct the necessary evaluations to determine safety-related initiative effectiveness, what is needed or whether the safety culture is (or other safety initiatives/programs are) effectively communicated and implemented in the field.⁴³
- There is confusion regarding the individual scope and function of the numerous safety-related initiatives rolled out since San Bruno. For example, interviews noted that CAP and the Safety and Environmental Management System (SEMS) appear to overlap regarding who is responsible for taking corrective action.⁴⁴ **Exhibit V-7** provides a summary of incident reporting systems. They are discussed in more detail in **Chapter X: Safety Reporting/Corrective Action** and **Appendix B**.

Exhibit V-7
Incident Reporting Systems

System	Owner	Deployment Date	Data	Notes
Report of Occupational Injury or Illness (ROII)	Corporate Safety	Pre-2013	<ul style="list-style-type: none"> Employee Injury Data MVI data Electric Incidents 	Retired with deployment of SEMS and Event Reporting Engine (ERE)
Nurse Line	Third Party data entry feeds SEMS	2012	<ul style="list-style-type: none"> Employee injury data 	
SEMS	Corporate Safety	May 2013	<ul style="list-style-type: none"> Injury data from Nurse Line with additional data entry MVI data (web portal and mobile apps) Near Hits for S&SS Near Hits for Power Generation until 2016 Near Hits for other LOBs (e.g., Customer Care and IT) 2017 	
ERE/Rapid Incident Notification System (RINS)	Safety and Human Performance	Late 2012/early 2013	<ul style="list-style-type: none"> Electric Operations Incidents Electric Operations MVIs Electric Operations Injuries Near Hits for Electric Operations 	Retired November 27, 2016. Incident and near hits now put in ECAP
CAP	Respective LOBs	2013 Gas 2015 S&SS 2016 Electric/ Power Gen 2017 all other LOBs	<ul style="list-style-type: none"> Near Hits for Gas and Electric Corrective Action Submittals Late 2016/2017 PG&E plans to automatically route non-serious injuries to the CAP system following intake 	

Source: DR 881.

- As discussed in **Chapter X: Safety Reporting/Corrective Action**, CAP, which originated in Nuclear, was modified for use in the remainder of the Company. The

⁴³ Various field observations and interviews.

⁴⁴ DR 062 and various field observations and interviews.

system was adopted by Gas Operations three years ago and then by Shared Services. However, its modification and application for Electric T&D was not implemented until late 2016.⁴⁵

- There is mixed and inconsistent use of the various “safety-oriented” *systems* among PG&E field personnel.⁴⁶ Some systems in place appear compulsory in their utilization — for example RINS and MVI. Some reporting systems are considered voluntary including CAP, Nurse Hot Line and Near Hits.⁴⁷ For Gas employees utilizing CAP, there is currently only a 28 percent employee-use rate — that is, only one-quarter of employees in Gas have used CAP in the first 32 months of rollout. Information provided to NorthStar regarding Near Hits do not indicate notifying employee — as such, it is not possible to draw accurate conclusions with regard to saturation.⁴⁸
 - Only a few of the field employees interviewed by NorthStar had used CAP. Among those that had used CAP, some were dissatisfied with the process and outcomes and indicated they would likely not utilize it again. Areas of dissatisfaction include:
 - The long development and implementation time, with uncertainty along the way.
 - Overlap with SEMS.
 - In the early stages, an issue may have been sent back to the originator for resolution. According to PG&E, this practice has been eliminated.
 - Some employees feel they do not receive any feedback on the resolution of the issue.
 - Limited field use.
 - Among the Electric T&D field employees who were asked to identify the Director of Safety and Workforce Excellence, only one recognized the position. In addition, only a few crew members were aware of the function and responsibilities of the corporate FSS.
- 6. Neither the Corporate or LOB FSS can cover PG&E’s service territory and diverse business operations effectively.**
- Crew members working out of the various service centers have very infrequent contact with assigned Safety Specialists. NorthStar rarely observed a Safety Specialist on site visits, with the exception of those individuals directed to be present as our escort or scheduled to be interviewed – one specialist had not previously been to the service center we were visiting.

⁴⁵ DR 881 and field observations

⁴⁶ Various field observations and interviews.

⁴⁷ Various field observations and interviews

⁴⁸ NorthStar analyses

- Most field crew members had little knowledge of who their designated corporate FSS was or what the function and responsibilities of the FSS was. Many crew members asked if they could identify their respective Field Sr. Safety Specialist —could not.⁴⁹
- When asked who they would contact with a specific safety issue, virtually all crew members indicated their foreman or supervisor would be first. When asked who next or who would they contact if the supervisor was unable to help, most were stumped.
- As shown in **Exhibit V-8** (following page), five LOB FSS cover 19 electric distribution divisions with 4,151 field employees, 70,000 square miles of service area and 142,000 miles of distribution lines.⁵⁰
- Three LOB FSS cover 907 electric substations in all 19 operating divisions.
- Two LOB FSS cover electric transmission 1,867 field employees in all divisions with 18,400 miles of transmission lines.
- Three LOB FSS cover 18 Gas Operating Divisions with 3,290 field employees, nearly 7,000 miles of gas transmission lines, three gas storage fields and 42,500 miles of distribution lines.
- Six LOB FSS and a Power Generation Safety Manager cover 780 non-nuclear power generation employees in many remote sites.⁵¹

Exhibit V-8
LOB Field Safety Specialists

Position	Work City	LOB	Area of Responsibility	Reporting Structure
Electrical Field Safety Specialist, Sr.	Antioch	Electric	Distribution - Bay Area	SVP ET&D ↓ Director ET&D ↓ Manager Safety Leadership Support
Electrical Field Safety Specialist, Sr	Walnut Creek	Electric	Distribution - Bay Area	
Electrical Safety Program Specialist, Sr	Chico	Electric	Distribution - North	
Electrical Safety Program Specialist, Sr	Paso Robles	Electric	Distribution - South	
Electrical Field Safety Specialist, Sr.	Monterey	Electric	Distribution - South Coast	
Electrical Field Safety Specialist, Sr	Vacaville	Electric	Substation - North	
Electrical Field Safety Specialist, Sr	Sacramento	Electric	Substation - North	
Electrical Field Safety Specialist, Sr	Madera	Electric	Substation - South	
Electrical Field Safety Specialist, Sr	Salinas	Electric	Transmission Line - South	
Electrical Field Safety Specialist, Sr	Red Bluff	Electric	Transmission Line North	
Gas Safety Specialist	Manteca	Gas Operations	Gas Operations - Central	SVP Gas Operations ↓ VP GT&D ↓ Superintendent
Gas Safety Specialist	Santa Rosa	Gas Operations	Gas Operations - North	

⁴⁹ Various field observations and interviews

⁵⁰ DR 004, 146, 147, and 329

⁵¹ DR 329

Gas Safety Specialist	Wasco	Gas Operations	Gas Operations - South	↓ Manager M&C
Safety Specialist	Gateway Generating Station	Power Gen	Fossil/Renewables	SVP Chief Nuc. Officer
Safety Specialist	Auburn Service Center	Power Gen	Hydro - Central Area	↓
Safety Specialist	Roger's Flat	Power Gen	Hydro - DeSabra Area	Sr. Director Power Gen.
Safety Specialist	Burney Service Center	Power Gen	Hydro - Shasta Area	↓
Safety Specialist	Auberry	Power Gen	Hydro - Southern Area	Director Power Gen. Stds.
Safety Specialist	Rock Creek Yard - Auburn	Power Gen	Project Execution (system-wide)	↓ Manager Safety

Source: DR 001.

7. LOB FSS organizational roles, responsibilities and accountability are unclear, particularly in relationship to LOB field management and corporate safety organizations.

- Field Managers interviewed (Superintendents/Supervisors/Foremen) did not know the roles/responsibilities of the FSS in any level of detail. Similarly, field personnel have only vague knowledge of corporate safety resources, organizational units and their roles and responsibilities.⁵²
- LOB FSS positions are not responsible for specific work products. Their roles and responsibilities vis-à-vis Corporate Safety Specialists remain unclear. When asked to provide examples of specific FSS work products on a daily/weekly/monthly basis, PG&E stated that they help generate safety messages, assist field employees and provide ad hoc observation reports using the Guardian tool – a system used to report safety and supervisory observations.⁵³
- Electrical FSS job responsibilities are somewhat vague and largely consist of coordination and participation activities, including the following:⁵⁴
 - Communicate (oral and written) recommendations and findings internally and externally.
 - Contribute to the Electric Operations safety strategy by collecting, analyzing, tracking, and trending field personnel safety data to determine strengths, gaps, and areas for improvement.
 - Partner with Safety Engineering and Health Services to align the corporate safety program and systematic issues.
 - Serve as a subject matter expert resource for electrical standards, procedures and for regulatory information as it relates to electrical work practices.
- Gas FSS job responsibilities are similarly vague, and include:
 - Perform job hazard analyses.
 - Identify, recommend and/or implement associated hazard mitigation.

⁵² Various field observations and interviews

⁵³ DR 369

⁵⁴ DR 328 Attachment 004

- Observe field work performed and advises Supervisors and field crews regarding the safest procedures and practices in conducting their work.
- Provide Emergency Response Gas Safety Support.
- The Power Generation FSS roles and responsibilities are also support roles and coordination-oriented, and include:⁵⁵
 - Provide safety subject matter expertise to LOB leaders.
 - Support project planning.
 - Develop safety programs.
 - Function as safety program implementation leads.
 - Develop/distribute safety communication.
 - Develop job hazard analyses.
 - Support local and Power Generation Safety Team grassroots teams.
 - Serve as subject matter experts in development of safety training.
 - Provide investigative support for motor vehicle incidents, injuries, near hits.
 - Provide field safety support.
 - Review site-specific safety plans.
 - Conduct/document safety observations/ inspections; and
 - Deliver tailboards as needed.
- PG&E safety training requirements for the FSS and Human Performance Specialists are somewhat limited and consist of the following.⁵⁶
 - CORP-0135WBT: Life Safety Training
 - CORP-0367WBT: Annual Code of Conduct (Management/Administrative & Technical)
 - SAFE-0211WBT: Bloodborne Pathogens
 - SAFE-0409WBT: Office Ergonomics WBT
 - SAFE-0439WBT: First Aid Awareness Level
 - SAFE-0440: Safety @ Heights: Competent
 - SAFE-0511WBT: Fire Extinguisher Training
 - SAFE-0615WBT: Heat Illness Prevention Training
 - SAFE-0731WBT: Hearing Conservation
 - SAFE-1491WBT: Personal Protective Equipment (PPE)
 - SAFE-1503WBT: Utility Std'd TD-1464S Fire Danger
 - SAFE-1505WBT: Arc-Flash Hazard Control Basics
 - SAFE-1506: First Aid/CPR and A.E.D. Certified Medic

Additional requirements for Gas FSS and Human Performance Specialists:

- ENVR-0100WBT: Haz. Materials & Waste Gen. Awareness
- ENVR-0220WBT: Habitat Conservation Plan - Field Employees
- CORP-0350WBT: FERC Standards of Conduct

⁵⁵ DR 329

⁵⁶ DR 328, 436 Attachment 001

8. Front-line supervisors do not spend enough time in the field. LOB field personnel appear to be genuinely committed to safety, but lack sufficient supervisory attention.

- It is important to continuously communicate the Company's commitment to improving the safety culture, yet field visits by supervisors are limited.⁵⁷
- First-line supervisory spans of control over the number of crew members is a potential indicator of the level of management oversight. PG&E was asked to provide the spans of control for each LOB along with source data and interpretations or analytical processes used to determine this ratio. The Company reported that the average span (number of direct reports to supervisor) for supervisors as of October 3, 2016 is almost 11:1 for the Electric T&D organization and 9.6 for the company as a whole.⁵⁸
 - As shown in **Exhibit V-9**, PG&E's "average span" data appears to include supervisors that do not actually supervise crews in gas, electric and generation because the lowest span of control is zero. This brings into question the use of the position title its impact on "average" span data reported.
 - While the average span for Electric T&D is noted as 10.9, dividing the number of employees by the number of supervisors gives an average span of 14.7.
 - Total employee numbers reported in the table are inconsistent with those provided in other data provided to NorthStar.⁵⁹

Exhibit V-9

Supervisor Span Range and Employee Counts by Line of Business as of October 3, 2016

Line of Business	Average Span	Highest Span	Lowest Span	Total Supervisors	Total Employees
Energy Policy and Procurement	6.4	10	4	5	279
Electric T&D	10.9	32	0	474	6,988
Gas Operations	10.1	46	0	422	5,892
Generation	6.0	27	0	266	2,479
Customer Care	12.0	356	0	195	3,432
Safety and Shared Services	11.0	30	0	105	2,037
Information Technology	8.5	19	0	105	1,784
Finance and Risk	4.2	9	0	25	509
Human Resources	5.0	14	0	16	545
General Counsel	5.1	9	2	10	161
Regulatory Affairs	5.3	8	3	3	173
External Affairs & Public Policy	3.0	3	3	1	242
Enterprise Programs	4.1	8	0	8	159
Chairman CEO & President	2.0	2	2	1	79
Other					39
Total	9.6	356	0	1,636	24,798

Source: DR 628.

⁵⁷ Various field observations and interviews

⁵⁸ DR 628

⁵⁹ For example, DR 004 employee numbers.

- NorthStar observed a much higher span of control during field observations of actual working crews than shown as “Average Span” and similar to those noted in the “Highest Span” data shown above.⁶⁰
- Supervisors’ and Superintendents’ presence in the field is critical for continued awareness and work/safety coaching but is limited due to competing managerial duties and extended spans of control. PG&E has not described a plan to improve work management planning and levels of supervision.
- The quality of tailboards, Job Site Safety Assessments (JSSA) used by Gas Operations, Job Hazard Analysis (JHA) and Job Safety Assessment (JSA) used by Electric T&D is dependent on continuing presence and attention to the activity by on site supervision. Participation by crew members improves when prompted by Supervisors, foremen, crew leads, or FSS. NorthStar’s field observations regarding tailboards and JSA identified the following issues, which may be improved with more frequent Supervisor site visits:
 - Tailboards and JSAs/JSSAs are performed inconsistently across the company.⁶¹ There does not appear to be effective training on how to perform these functions nor an evaluation of their effectiveness.
 - Tailboards are performed by all work groups, but differently. Gas is done at the job site with a form/pad to record. Electric is done at the Service Center “bull room” at the beginning of shift. Supervisors draw from a selection of briefing materials to provide relevant content for their current tailboard discussions. Some tailboards are provided weekly, others are daily.
 - Personnel all sign that they were present but not whether they paid attention.
 - The Job Safety Analysis is generally done at job site. In some cases, NorthStar was invited to sign JSAs upon arrival at job sites even when the JSA was conducted earlier in the day – suggesting that field personnel may have been complying with written policy but lacking understanding of the objective. Some appeared to be covered by rote.

9. LOB field employees generally are aware of, and comply with, fundamental safety practices; however, there are some inconsistencies.

- Field visits revealed general compliance with Personal Protective Equipment (PPE) requirements with few exceptions. Some varied uses of PPE were observed:
 - Gloves are the most infrequently worn PPE even though they are included in all descriptions of PPE wear.
 - Safety eyewear was worn the majority of time, with a few exceptions. On two occasions crew members were observed wearing designer sunglasses in place of safety eyewear (these designer glasses could have been safety-rated or prescription lens).

⁶⁰ Various field observations and interviews.

⁶¹ Various field observations and interviews.

- Shaded safety glasses were the most commonly worn among crew members. However, they quickly become ineffective when the work moves to heavily shaded or dark areas; then they are removed.
- Safety vests and hard hats were the most consistently worn PPE.
- There is little evidence that coordinated, unified or consistent pre-work stretching exists or is practiced. This is an element of PG&E's Industrial Athlete Program. Although NorthStar spent considerable time in the yards observing conversations, workers filling ice and water, vehicle preparations and the like, employees were rarely observed stretching.
- In the field, employees followed the approaches and procedures of their respective crew leader (typically a foreman or lead) and other senior workers.
- Grassroots participation and corresponding success is inconsistent and dependent on overall positive support from local/regional superintendents and supervisors. Staff members not involved in the grassroots program offered mixed feelings regarding the program. Some see it as a positive exercise with positive results, and some see it as a waste of time and, more negatively, an opportunity for field resources to get out of work. The level of operational maturity of the grassroots teams varies by organization/team.
- At some sites, NorthStar noticed insufficient care in maintaining a safe workplace — equipment, tools and supplies were strewn about haphazardly on the ground, very often within inches of underground work areas, causing a potential tripping hazard. An employee was observed tripping over the air monitor inches from an open, underground vault. Had he not regained his footing, the fall could have resulted in serious injury.
- PG&E has been firm in its requirement of Fire Retardant (FR) clothing for employees in the field. However, FR requirements are inconsistent.⁶²
 - Electric employees are required to wear FR clothing every day. When the temperature reached over 100 degrees in Willow, there was no apparent value to the FR clothing and crews voiced concerns of potentially increasing heat stroke or dehydration risks.
 - At the Hinkley and Topock Compressor Stations, Gas Technicians are required to wear FR clothing since they occasionally work on the generation equipment. However, Mechanics stated that they are not required to wear FR clothing on a daily basis even though they also work on the generation equipment.
 - The contract security guard at Hinkley is required to wear FR clothing at the front gate, while supervisors in the administration building who frequently travel to the compressors are not required to wear FR clothing.

⁶² Various field observations and interviews.

- Compressor station operators have recently been required to wear safety vests, even though many workers spend the entire shift within the fence line where there is neither traffic nor moving hazards.
- Some employees report excess washing to increase the comfort of the FR clothing, potentially reducing its effectiveness.
- A significant level of safety training is embedded in field personnel technical training as discussed in greater detail in **Chapter VIII: Training**. Mandatory safety classes for Electric T&D, Gas Operations and Power Generation field personnel are listed in **Exhibit V-10**. This largely leaves updates to safety-related policies, procedures, techniques and approaches – all contributing to safety awareness – to annual or refresher training and “stand downs” (issue specific activities).
- Safety training (other than Safety Leadership Training) is not assigned by employee level. It is generally assigned to job classifications.
- The total days of training and the average hours per field employee (IBEW T200/T300) per year by category of field LOBs can only be estimated based on course duration values.

Exhibit V-10
Mandatory Safety-Related Courses for Electric T&D, Gas Operations and Power Generation Field Workers [Note 1]

One-Time Training	Annual Training
SAFE-0135: Asbestos-Pipe Wrap and Gaskets Initial	CORP-0135WBT: Life Safety Training
SAFE-0141: Asbestos - Class I/II - Worker - Initial	CORP-0804WBT: Cyber and Physical Security Awareness
SAFE-0173: Asbestos - Class III - Maint. Worker Init.	SAFE-0136: Asbestos-Pipe Wrap and Gaskets Refresher
SAFE-0440: Safety @ Heights: Competent	SAFE-0151: Asbestos - Class I/II - Worker - Refresh
SAFE-0454: Safety At Heights - Authorized Person	SAFE-0172: Asbestos Class III Maint Worker Refresh
SAFE-0615WBT: Heat Illness Prevention Training	SAFE-0174: Asbestos - Class IV - General Awareness
SAFE-0891: HAZWOPER - Worker - Initial	SAFE-0211WBT: Blood-borne Pathogens
SAFE-1101: Scaffolding Safety - Authorized Person	SAFE-0395: Ergonomics - Industrial Training
SAFE-1102: Scaffolding Safety - Competent Person	SAFE-0409WBT: Office Ergonomics WBT
SAFE-1201WBT: Confined Space - Awareness	SAFE-0511WBT: Fire Extinguisher Training
SAFE-1205: Confined Space- Non-Entry Rescue	SAFE-0731WBT: Hearing Conservation
SAFE-1290WBT: Portable Ladder Safety	SAFE-0892: HAZWOPER - Worker - Refresher
SAFE-1491WBT: Personal Protective Equipment (PPE)	SAFE-1100: Respiratory Protection
SAFE-1504: Lead Awareness for Construction	SAFE-1503WBT: Utility Std TD-1464S Fire Danger
SAFE-1505WBT: Arc-Flash Hazard Control Basics	Biennial Training
SAFE-9017WBT: Globally Harmonized System (GHS)	SAFE-0408WBT: Office Ergonomics WBT
	SAFE-0439WBT: First Aid Awareness Level
	SAFE-1506: First Aid/CPR and A.E.D. Certified Medic

Note 1: Courses profiled to IBEW employees as of August 19, 2016, based on job.

Source: DR 436 Attachment 1, DR 293 Attachment 1, NorthStar analysis.

D. RECOMMENDATIONS

1. Improve processes used to evaluate and translate best practices and techniques from one LOB organizational unit to others. Focus LOB FSS roles and responsibilities on integrating best practices among all LOBs, facilitating the implementation of corporate safety initiatives, and improving safety practices and awareness across all organizational units.
2. NorthStar does not believe the FSS can be effective even in significantly great numbers given the geographic challenges associated with PG&E's service territory and the diverse job requirements. A more effective use of the FSS would be to have them focus on and support the first-line supervisors – foremen and crew leads.
3. Perform a broad reassessment of all safety programs and initiatives to:
 - Evaluate overall effectiveness and make improvements.
 - Eliminate scope overlap (e.g., CAP vs. SEMS follow-up responsibility).
4. Reevaluate staffing, roles, responsibilities and work requirements to increase Supervisor's time in the field supervising crews.
 - Continuous reinforcement of the safety culture message.
 - Leveraging improved techniques and training.
 - Standardizing work methods.
5. Increase the training requirements for LOB FSS. Existing OSHA training is somewhat generic and not sufficiently related to PG&E's public and occupational hazards. LOB FSS should receive training related to:
 - The Keys to Life/SIF Prevention Program.
 - A condensed version of the training provided to linemen and gas service representatives, that is focused on safety aspects of their work.
6. Reevaluate the travel requirements placed on employees to reduce the overall mileage driven. Accelerate the use of mobile technology and electronic information exchange. PG&E employees drive a significant number of miles per year and are frequently called upon to support workload at great distances from their normal assigned locations.

Recommendations for the Commission

1. Work planning and preparation has a significant impact on job safety. When utility work has an identified public safety impact, the CPUC needs a multi-agency hot line that PG&E (or other utilities) can call and request that the Commission contact the municipal

permit department to encourage interagency collaboration and expedite work permits on an exception basis.

CHAPTER VI: BUDGETING AND SPENDING

This chapter provides the results of NorthStar's review of PG&E's budgeting and spending for safety-related capital and operations and maintenance expenses.

A. BACKGROUND

PG&E has an enterprise-wide integrated planning and budgeting process which was introduced in 2012. Prior to this, PG&E had a company-wide approach to long-term planning, but budgeting, strategy and risk management were largely addressed at the LOB level. PG&E has three operating LOBs: Electric T&D, Gas Operations, and Generation (includes nuclear generation, which is not addressed in this report). Other organizational units such as Safety and Shared Services and Regulatory Affairs are also considered LOBs for the purpose of preparing the annual integrated plan.¹

Following the San Bruno incident, PG&E's newly appointed CEO encouraged senior executives to develop an integrated planning process to better identify and mitigate business risks on an enterprise-wide basis, including those having safety implications. In February 2012, several senior officers visited General Electric (GE) and were given a demonstration of the integrated planning process GE was using. This presentation served as the blueprint for PG&E's Integrated Planning Process (IPP).²

PG&E has added two processes to the IPP to specifically address and quantify risk. These are the Risk Evaluation Tool (RET) and the Risk Informed Budget Allocation (RIBA). Each of these is described following discussion of the overall IPP.

Integrated Planning Process

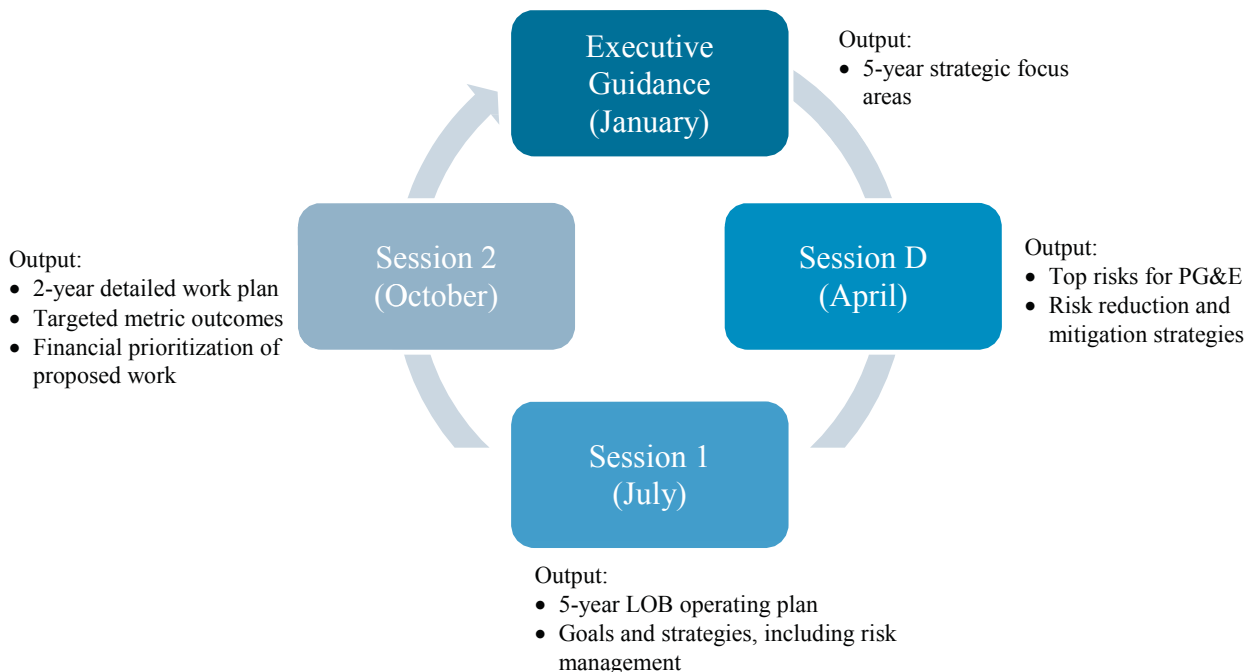
Exhibit VI-1 provides an overview of PG&E's IPP.³ Session D (Risk Mitigation Strategies) was introduced in 2013. PG&E has since made minor modifications and improvements to the IPP, but the process remains largely the same.

¹ DR 039 Attachment 006

² DR 040

³ DR 038

Exhibit VI-1 Overview of PG&E IPP Process



Note: Exhibit indicates target months; actual IPP session dates may vary.

Source: PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

Key steps in PG&E's annual IPP are as follows:

- **Executive Guidance** – The initial step in the annual planning and budgeting process is the Executive Guidance forum in January. In this step, PG&E's CEO and Presidents establish company-level goals and objectives over the next five-year planning horizon.⁴ While each year's Executive Guidance includes four of the years from the prior year, targets for those years are often changed in the new Executive Guidance.⁵
- **Session D** – At the annual Session D meeting, senior officers discuss: 1) the top risks for the Company and for each LOB; 2) risk reduction or mitigation progress to date; 3) strategies to manage any risk mitigation challenges; 4) future risk management plans; and 5) areas where collaboration across LOBs or additional resources may be required to manage risk. A major outcome of Session D is a list of risk priorities for the Company, and identified enterprise risks that are overseen by the Board of

⁴ DR 004 Attachment 003

⁵ DR 039

Directors.⁶ The information collected in Session D informs PG&E's strategy and execution plans that are developed in Sessions 1 and 2 (S-1 and S-2).⁷

- **Session 1** – Following Session D, each LOB develops its 5-year operating plan (also known as its S-1 submission) to achieve the Company's and the LOB's strategic goals. In the S-1 submission, the LOBs identify their top operational and compliance risks and describe how the strategic plans included in S-1 address the risks and compliance items identified in Session D. S-1 requires each LOB to identify: 1) anticipated funding levels for mitigating or managing each top risk; 2) an estimate of how the risk status will change over time as mitigation and management initiatives are implemented; and 3) a metric for assessing progress in addressing the risk. At the S-1 meetings in July, the Company's CEO and senior officers from every LOB meet to discuss and understand each other's goals, strategies, and priorities. At the completion of the S-1 meetings, the Company's leaders agree on the strategic plans and the estimated funding for each LOB to achieve the Company's strategic goals.⁸
- **Session 2** – The objective of the S-2 financial prioritization meeting is a final set of work and budget targets for each LOB for the coming year. Following Session 1, each LOB engages in the Session 2 process to develop a detailed 2-year work plan to execute goals, strategies, and priorities agreed upon during the S-1 process. The S-2 submission includes targeted performance outcomes for the proposed work plan, and each LOB also provides an analysis showing how its overall risk profile will change year over year as it implements its work plan. In the S-2 process, the LOBs start with the funding recommendations from the S-1 financial prioritization meeting. The Company's CEO and senior officers from every LOB meet collectively during the S-2 meetings in October or November to discuss each LOB's execution plan, align on performance metrics, and ultimately approve budgets for the following year for each LOB.⁹

Risk Evaluation Tool

PG&E uses a structured process to evaluate and prioritize company risks and develop the inputs for Session D. All PG&E LOBs use the Microsoft Excel spreadsheet-based RET Model to score the magnitude of their risks. RET is a matrix approach which uses categories of qualitative and quantitative criteria to determine a total score for a risk. PG&E's RET examines operational risks that LOB subject matter experts (SMEs) deem important enough to include for consideration in the RET model. The term "risk register" is used by PG&E to refer to the roster of all risks assessed in RET.¹⁰

The primary function of RET is to help top corporate officers in the Risk and Compliance Committee in Session D become aware of the most significant operational risks that have the

⁶ DR 004 Attachment 003

⁷ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

⁸ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

⁹ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

¹⁰ S-Map Final Decision, Appendix A

potential to affect the operation and viability of PG&E as an ongoing enterprise. RET's secondary function is to allow the LOBs to see all top operational risks at once in order to prioritize top operational risks for mitigation strategies in Session 1.¹¹

Each LOB uses the same RET model, but each LOB creates its own risk register and estimates its own set of risk drivers, failure modes, consequence scenarios, and risk scores. SME input is used throughout the RET process ranging from threat identification to risk score evaluation.¹²

The original RET model (RET 1.0) was implemented in 2013 and scored risks using the using a 3x3 scale consisting of high, medium, and low impacts, and an assessment of potential frequency.¹³

The current RET model (RET 2.2) addresses six impacts (consequences) of a risk:

- Safety – A situation or circumstance that may result in an illness, injury, or fatality to employees or the general public.
- Reliability – Disruption of the company's core business functions (gas and electric delivery).
- Environmental – Actual or potential threat of adverse effects on living organisms and the environment by effluents, emissions, wastes, resource depletion, etc., arising out of an organization's activities.
- Compliance – Risks arising from violations of, or nonconformance with, laws, rules, or regulations.
- Trust – Risk arising from negative perception on the part of customers, business partners, investors, shareholders, or regulators that can adversely affect the organization's ability to establish business trustworthiness.
- Financial – Damage to third party properties, loss of assets and facilities, fines, lawsuits, restitution, remediation, restoration, cost of replacement energy, redistributed customer costs.¹⁴

LOB SMEs determine a score for each impact based on an estimated 95th-percentile probable worst case outcome scenario (a "P95" scenario). The impact risk criteria selection is based on a 1 to 7 magnitude level, using a logarithmic scale to increase differentiation between risks and provide a clearer view of the relative priority of risks.¹⁵ The Safety impact levels are shown in **Exhibit VI-2**. There are similar tables for the other five risk impact areas.¹⁶

¹¹ S-Map Final Decision, Appendix A

¹² S-Map Final Decision, Appendix A

¹³ DR 039

¹⁴ DR 040 Attachment 004

¹⁵ S-Map Final Decision, Appendix A

¹⁶ S-Map Final Decision, Appendix A

Exhibit VI-2 Safety Impact Levels

Impact Level	Description
Catastrophic (7)	Fatalities: Many fatalities and life threatening injuries to the public or employees.
Severe (6)	Fatalities: Few fatalities and life threatening injuries to the public or employees.
Extensive (5)	Permanent/Serious Injuries or Illnesses: Many serious injuries or illnesses to the public or employees.
Major (4)	Permanent/Serious Injuries or Illnesses: Few serious injuries or illnesses to the public or employees.
Moderate (3)	Minor Injuries or illnesses: Minor injuries or illnesses to many public members or employees.
Minor (2)	Minor Injuries or illnesses: Minor injuries or illnesses to few public members or employees.
Negligible (1)	No injury or illness or up to an un-reported negligible injury.

Source: DR 040 Attachment 4.

SMEs also estimate the frequency of the risk between 1 and 7, in accordance with the table shown as **Exhibit VI-3**.

Exhibit VI-3 RET Frequency Levels

Frequency Level	Frequency
Common (7)	> 10 times per year
Regular (6)	1 - 10 times per year
Frequent (5)	Once every 1 - 3 years
Occasional (4)	Once every 3 - 10 years
Infrequent (3)	Once every 10 - 30 years
Rare (2)	Once every 30 - 100 years
Remote (1)	Once every 100 + years

Source: DR 040 Attachment 4.

PG&E categorizes its risks in two groups: enterprise risks and operational risks.

- Enterprise Risks are those that potentially could have a catastrophic impact on the Company, as described by impact category level 7 in the RET model. All enterprise risks are reported to the Board, where mitigation plans and the status of mitigation efforts are discussed.
- Operational risks are managed at the LOB level.

Calibration sessions are used to ensure consistency of SME-assigned scores across threat causes and across LOBs.¹⁷

Risk Informed Budget Allocation

PG&E uses a formal, structured process to address safety and other risk factors in the operating LOBs' work plans discussed in Sessions 1 and 2. In 2014, PG&E introduced the RIBA framework to evaluate and prioritize the work portfolios for its operational LOBs: Electric T&D, Gas Operations, Power Generation, and Nuclear Generation (not addressed in this report). The LOB determines a RIBA score for each project, with input from engineers, asset owners, program managers, and other stakeholders and SMEs.¹⁸

The RIBA scoring methodology considers each project's impact on:

- Safety risk
- Reliability risk
- Environment risk

The RIBA scoring process also "flags" attributes of the investment as:

- Mandatory
- Compliance requirement
- External commitments
- Interrelated with other projects
- Work requested by others
- Capacity

The RIBA model is a detailed Excel spreadsheet which captures basic project data, projected costs, and SME input regarding the impact and frequency of the three risk areas: Safety, Environmental, and Reliability. The impact and frequency of each risk are rated from 1 to 7 to determine the Safety, Environmental, and Reliability risk scores. Unlike RET, the RIBA risk score is not weighted to increase focus on safety. Safety Risk, Environmental Risk and Reliability Risk are equal components to the RIBA risk score.

RIBA Risk Score = Safety Risk Score + Environmental Risk Score + Reliability Risk Score.

¹⁷ S-Map Final Decision, Appendix A and DR 039

¹⁸ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

The LOBs use RIBA scores and flags for project prioritization and budget allocations, but also consider other elements, such as project interrelationships, resource constraints, regulatory decisions, outage windows, and whether the project can be executed. As summarized in **Exhibit VI-4**, the RIBA Excel spreadsheet also documents project commitments and other considerations used in prioritization discussions.

Exhibit VI-4
RIBA Model Instructions Regarding
Documentation of Commitments and Other Considerations

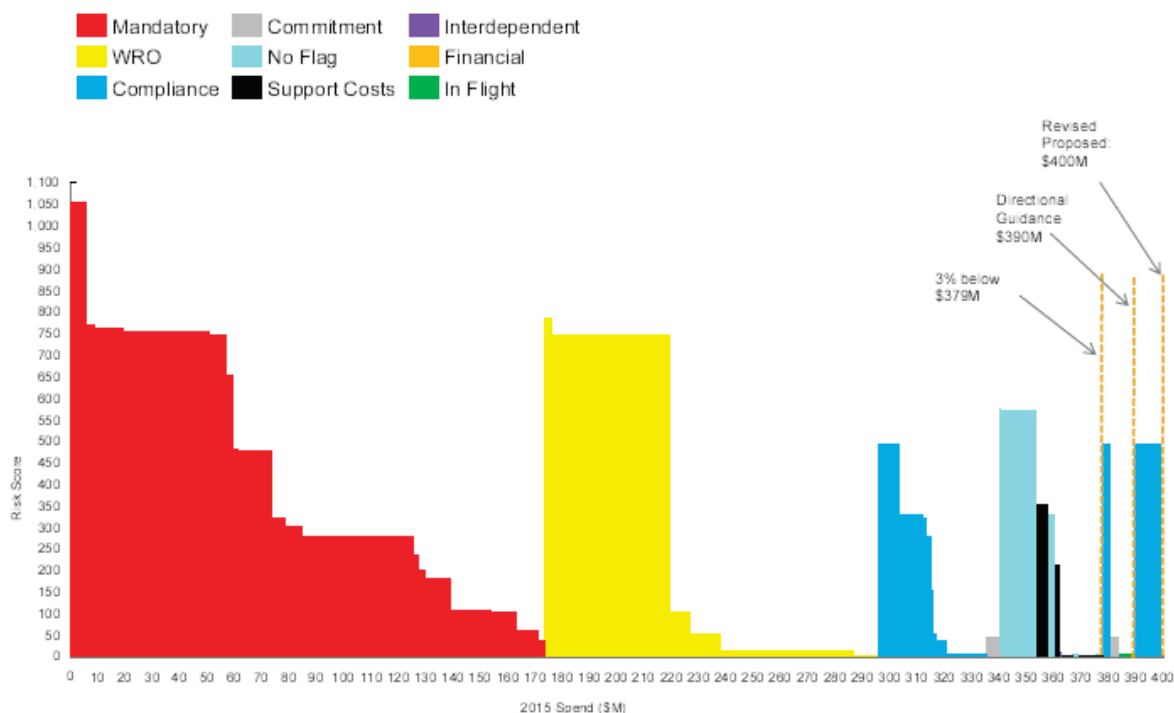
Commitments and Requirements (Choose one of the following, or None)	
Mandatory	Must be conducted in the budget or forecast year to comply with a regulation
Regulatory Compliance	Work that is required to comply with a regulation, but that does not meet the definition of “Mandatory”
Commitment	The Company has made a specific commitment to completing the proposed work in a public forum or to regulators. Includes Rule 20A work
Work Requested by Others (WRO)	Work requested by others spans agricultural-related requests, and new business (customer connections)
Other Considerations (Select YES OR NO for each of the following)	
Inflight	Under construction or 50% of total expected cost committed as of the beginning of the budget year (e.g. if in 2014 planning for 2015, then as of 1/1/2015). Applies to project work that has a defined scope.
Inter-relationships with other projects	Used to indicate that the proposed work either must, or should, be done in conjunction with other work (e.g. opportunity created by a planned outage or having a trench open)
Capacity	Work required to meet changes in system demand or load growth in the future
Support	IT apps & infrastructure; tools & equipment; fleet; buildings, roads and physical infrastructure; training
Financial Impact (Select Hard, Soft, or None)	
Hard Financial Benefits	Any sustainable net cost reduction (measured in dollars) from an established point of reference. Examples of this type of benefit are: <ul style="list-style-type: none"> • Money derived from a change in past behaviors/processes • Reductions in unit cost or Increases in throughput/efficiency relative to spend • Full-time equivalent (FTE) reductions • Overtime/double-time reductions • Improved revenue collection
Soft Financial Benefits	Any productivity or business improvement from an established business standard. Examples of this type of benefit are: <ul style="list-style-type: none"> • Re-deployment of headcount within Department • Replacing obsolete technology • Avoided costs • Financial risk reduction (compliance support) • Employee work-life benefits

Source: DR 204 Attachment 001.

The LOBs prepare RIBA charts to use as bases for discussions in Sessions 1 and 2 to gain an understanding of the nature and costs of the work portfolio of the upcoming year, and to examine the impact of budget modifications. A representative RIBA chart is shown in **Exhibit VI-5**. It shows the RIBA score on the vertical axis, and spending along the horizontal axis, with budget targets ranging from \$370M to \$400M. Projects are generally grouped by “flags,” or “other considerations” with the higher priority flags (in this case mandatory work) at the left. As shown in **Exhibit VI-5** within each flag area, projects are generally ranked by RIBA score. In some cases, the ranking for a specific “flag” may be split, as is the case for the “compliance category” below. This reflects factors such as system constraints, resource constraints, work optimization, and financial constraints. In this case, consideration of these other factors led to lower priority for some regulatory compliance work that was not due in the budgeted year.

Exhibit VI-5 Representative RIBA Chart

2015 Gas Distribution Expense S1 (\$millions)



*Does not take into consideration Balancing Account proposed in the PD. Some levers used are included in the BA

Source: DR 315 Attachment 001.

The output from the initial RIBA scoring supports the materials developed by each operational LOB for Session 1. In Session 1, the VP of Business Finance facilitates a financial prioritization meeting with the senior officers from all LOBs. Session 1 discussion topics include funding requests for each LOB, the approach each LOB took to arrive at its prioritized list of work, and the LOB’s RIBA-scored portfolio. The objectives of the Session 1 financial prioritization meeting are to confirm the final set of strategic

initiatives and funding recommendations for PG&E and for each LOB for the following five years.¹⁹

Following Session 1, the LOBs often adjust the RIBA input to reflect information collected during the Session 1 process and updated project information. The revised RIBA scoring is used as an input to the Session 2 discussions regarding work for the next two years. At the conclusion of Session 2, the final RIBA output is a risk-scored portfolio of work that each LOB uses to inform its rate case forecasts and execution plans. To support both the S-1 and S-2 processes, the RIBA scores are calibrated across LOBs to make sure the scores are consistent.²⁰

Emergent Work

Throughout the year, the LOBs may identify emerging issues or work items not identified in the IPP from the prior year. These emerging issues often require the reevaluation of the LOB work portfolios and may result in a reprioritization effort, either within the individual LOB or at the enterprise level, to ensure the emerging issues are addressed.²¹

PG&E sets aside a reserve to address emerging issues during the year that may require a timely and flexible response outside of the standard IPP. This reserve fund provides the Company's management with flexibility in dealing with unplanned items. The process of approving and releasing reserve funds is overseen by the Company's Financial Plan Committee (FPC), which is comprised of the Utility Presidents, Senior VP and Chief Financial Officer, and VP of Business Finance. The FPC holds monthly meetings with the senior management of any LOB requesting reserve funding to review, discuss, and approve the requests. Reserve funds are fully allocated in the current year and are not carried over to the following years.²²

Safety Model Assessment Proceeding and Risk Assessment Mitigation Phase

On November 14, 2013, the Commission opened the Risk Order Instituting Rulemaking (OIR)²³. The purpose of this rulemaking was to incorporate a risk-based decision-making framework in the energy utilities' General Rate Cases (GRCs). Two new procedures were established to feed into GRC applications which request funding for safety-related activities:

- **Safety Model Assessment Proceeding (S-MAP) Filing** – The purposes of S-MAP are to: 1) allow parties to understand the models the utilities propose to use to prioritize programs/projects intended to mitigate risks (safety and other risks); and 2) allow the Commission to establish standards and requirements for those models. PG&E, and other large energy utilities, issued their S-MAP filings in May 2015. In

¹⁹ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

²⁰ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

²¹ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

²² PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

²³ Rulemaking (R.) 13-11-006 Order Instituting Rulemaking to Develop a Risk-Based Decision-Making Framework to Evaluate Safety and Reliability Improvements and Revise the Rate Case Plan for Energy Utilities

August 2016, the CPUC issued an interim S-MAP decision which found that the utilities' models have their shortcomings and adopted a multi-attribute approach to risk models and directed the utilities to take steps towards a more uniform risk management framework. It also approved an interim Road Map to migrate from relative risk scoring to more quantitative methods for optimized risk mitigation subject to review and revision in the second phase of this S-MAP.²⁴

- **Risk Assessment Mitigation Phase (RAMP) Filing** – In the next GRC, each utility must file a RAMP describing how it plans to assess, mitigate, and minimize its risks. The RAMP submission, as clarified and modified in the RAMP proceeding, will then be incorporated into the large energy utility's GRC filing. -PG&E will submit its first RAMP filing associated with the 2020 GRC in November 2017. The S-MAP Interim Decision explicitly requires that RAMP filings include calculations of risk reduction and a ranking of mitigations based on risk reduction per dollar spent.²⁵

B. EVALUATIVE CRITERIA

- What is the role of the Companies' Boards of Directors and Executive and Senior Management in the development of budgets, budget reviews and approvals? What priority is given to safety in these processes?
- PG&E has recently increased investments in its infrastructure and spending on its operations in order to improve safety. Does PG&E prioritize and realize improvements to its safety culture and procedures with sufficient speed, deliberation and effectiveness?
- Does PG&E consistently use its Integrated Planning Process (IPP) process to obtain funding for its safety-related initiatives?

C. FINDINGS AND CONCLUSIONS

1. **PG&E does not routinely budget and track safety-related costs as a separate category; rather, it classifies costs as "safety-related" if they involve safety, reliability, and/or integrity activities. It is impossible to determine how much PG&E spends on safety alone.**

- PG&E identifies all spending by major work categories (MWC). These MWCs may be broken down into Maintenance Activity Types (MATs), which may be further broken down to planning orders. The exact process and definitions of these categories differ by LOB.
- PG&E classifies MWCs as "safety-related" if they relate to safety, reliability, or integrity activities. The result is that all MWCs except for those related to new

²⁴ Decision 16-08-018, August 18, 2016 (S-MAP Interim Decision)

²⁵ Decision 16-08-018, August 18, 2016 (S-MAP Interim Decision)

business, work requested by others and Rule 28 (Electric Undergrounding) are classified as safety.²⁶

- NorthStar performed a detailed review of selected MWCs and found it was extremely difficult to separate safety costs from reliability and integrity. The MWC structure is not intended to segregate safety and other costs.
 - NorthStar requested safety-related MWCs and MATs for Electric T&D, Gas Operations, and Power Generation.
 - Gas Ops provided safety-related MWCs that are consistent with the MWCs identified as related to safety, reliability, and integrity activities in the semi-annual Gas Transmission and Gas Distribution safety reports to the CPUC
 - Electric T&D and Power Generation provided MWCs that are consistent with the annual GRC budget compliance reports. (Electric Transmission spending is not included in the annual budget compliance reports because these costs are litigated in the Transmission Owner (TO) rate cases filed with the Federal Energy Regulatory Commission.)
 - NorthStar selected MWCs in each LOB and drilled down to the MAT and Planning Order levels to analyze whether it was possible to determine whether an MWC or MAT contained only safety-related spending.
 - In general, NorthStar found that MWCs and MATs contain a mixture of safety, reliability and integrity costs. Only at the planning order (project) level is it possible to identify safety-related-only costs. In essence, this entails reviewing costs on a project by project basis.²⁷ Electric T&D, Gas Operations, and Power Generation execute several thousands of projects each year. The detailed RIBA scoring of each project shows PG&E's scoring of safety, reliability, and environmental impacts.
 - PG&E plans to better identify safety-related costs as part of the RAMP and S-MAP requirements. In Phase 2 of the S-MAP proceeding, the CPUC is evaluating whether PG&E's RET and RIBA processes should be replaced. How Phase 2 is resolved will inform how safety impacts (as opposed to reliability or other impacts) are used to prioritize spending. The Commission's December 13, 2016, Scoping Memo for Phase 2 calls for a final decision in that proceeding by Spring 2018.²⁸

²⁶ DR 162 Attachments

²⁷ DR 499, DR 500, DR 501, DR 502, IR 141, IR 185, IR 186

²⁸ DR 749

2. In interviews, every BOD Director expressed support for any safety-related expenditure requested by management.²⁹ However, the Boards approve only highly aggregated budgets by LOB, not specific projects unless they exceed the specified amount.³⁰

- The Board Finance Committee recommends budget approval to the Board after reviewing capital and expense budgets by LOB and the top five programs and projects.
- NorthStar consultants attended a meeting of the Finance Committee at which detailed presentations of material from the IPP were made by Finance staff including RIBA results for some LOBs. Committee members were actively involved in questioning the materials and clearly had a detailed understanding of the process and the projected values.
- The highly aggregated budgets approved by the Boards are the result of the IPP which incorporates safety as a critical element in evaluating and ranking all projects.
- All enterprise risks are reported to the Board, where mitigation plans and the status of mitigation efforts are discussed.³¹

3. Executive and Senior Management exert a top-down influence on safety-related expenditures. Work on facilities and infrastructure is largely determined in a bottom up process that is part of the IPP and thoroughly incorporates safety through use of the RIBA.

- Executive and Senior Management may reduce spending on the lowest-ranked safety projects by establishing aggregate spending limits for each LOB.
- If staff in the operating LOB believe that a project that would be dropped or delayed due to spending limits is in fact critical to the safe and successful operation of the LOB, they have several steps they can take to allow completion of the project including: slowing one or more projects to make more budget available in the planned year or deferring one or more projects to a following year.³²
- Executive and Senior Management play a direct role in approving expenditures for staff, consultants, programs and training that are safety-related.

²⁹ IR 23-32

³⁰ DR 206 Attachment 003

³¹ DR 006, December 19, 2012, IPP Presented to the Board

³² DR 697-711. Some of the attachments to DRs 701, 703 and 705 are CONFIDENTIAL

4. Safety performance is addressed in each year's Executive Guidance from 2013 to 2016.

- Until 2016, the, CEO, CFO and Presidents were responsible for formulating the Executive Guidance. In 2016, the process was modified to include LOB leaders.³³
- **Exhibit VI-6** presents an overview of Executive Guidance issued from 2013 to 2016. Executive guidance related to safety is highlighted in grey.
- Each year's Executive Guidance identifies specific goals for safety performance, even though these safety goals are tied to different strategic goals. Safe Service was only identified as a strategic goal in 2014, but safety is a key component of the goal to achieve industry leading performance.
- The safety performance goals have changed from the "original goal of "top *decile* in 2016" to the current goal of "top *quartile* in 2018". Also, the Executive Guidance in 2016 provides specific safety deliverables to be completed in 2017.

³³ IR 53

Exhibit VI-6
PG&E Executive Guidance 2013 – 2016 [Note 1]

	2013	2014	2015	2016
Over-Archiving Guidance	Deliver on Commitments Made to our Stakeholders	Deliver Safe, Reliable, and Affordable Service	Deliver Operational Excellence Be the Provider of Choice Position PG&E for the Future	Deliver Operational Excellence Be the Provider of Choice Position PG&E for the Future
Guidance	<p>Regulators: deliver a constructive relationship built on trust and transparency</p> <ul style="list-style-type: none"> • Drive top decile safety performance by 2016. 1st quartile by 2015 • Operational performance goals and target dates • Monitor key operational risks and comply with regulatory directives • Engage with regulators to achieve positive outcomes in rate cases <p>Customers: deliver outstanding customer satisfaction</p> <p>Employees: deliver an engaging work environment</p> <p>Investors: deliver financial plans that ensure long-term growth</p>	<p>Safe Service</p> <ul style="list-style-type: none"> • Drive 1st quartile employee safety performance by 2018 (LWD, Days Away, Restricted or Transferred (DART), SPMVIs) • Drive 1st quartile public safety performance by 2018 (Safety Dashboard) • Develop and sustain an industry- leading safety culture <p>Reliable Service</p> <ul style="list-style-type: none"> • Strategically determine where to focus and drive 1st or 2nd quartile performance by 2019 • Reduce key risks: Within 5 years, implement and close 90% of mitigation actions for the top risks identified in each Session D <p>Affordable Service</p> <p>Customer Service</p> <p>Employee Engagement</p>	<p>Achieve industry leading performance</p> <p>Safety – continue to build a collective commitment to safety culture, ultimately leading to 1st quartile public & workforce safety by 2018 and beyond</p> <p>Risk – Continue to advance the data-driven risk management framework</p> <p>Compliance – Build a collective compliance culture</p> <p>Operational – Meet performance goals/dates</p> <p>Meet our financial commitments</p> <ul style="list-style-type: none"> • Earn our authorized return <p>Proactively lead and engage our workforce</p> <ul style="list-style-type: none"> • Meet performance goals/dates <p>Deliver cost-effective services</p> <p>Price services based on customer needs</p> <p>Lead in customer satisfaction</p> <p>Enable the “Grid of Things”</p> <p>Enable our integrated resource strategy</p> <ul style="list-style-type: none"> • Achieve current and future California mandates and emerging technologies cost effectively <p>Lead in economic and environmental sustainability</p>	<p>Achieve industry leading performance</p> <p>Safety—Be a national leader on public safety and achieve 1st quartile public and workforce safety (2018); create an open climate to raise issues; improve employee health and build leadership capability and commitment.</p> <ul style="list-style-type: none"> • Implement CAP enterprise-wide (2017); SIF checklists in everyday work procedures (2017); Implement Workforce Health/Early Intervention initiatives (2017); Leaders complete the Safety Leadership Development (2017) <p>Compliance. Compliance with legal and regulatory requirements.</p> <p>Risk. Quantitative methodologies to define tolerable risk levels for top risks by 2020</p> <p>Reliability. 2nd quartile performance in core operations</p> <p>Deliver cost-effective services</p> <p>Meet evolving customer expectations</p> <p>Expand our stakeholder engagement</p> <p>Maximize the value of our Gas and Electric Systems</p> <p>Continue to attract capital to deliver on our plans</p> <p>Lead, engage & develop our workforce</p>

Note 1: Safety-related guidance is highlighted. NorthStar created the distinction between “Over-Archiving Guidance” and “Guidance.” NorthStar also modified guidance wording for brevity.

Source: DR 039 Attachments 001-004, NorthStar Analysis.

5. Safe service, which includes safety, environmental, and compliance impacts, has a 40 percent weighting in the determination of RET scores.

- In early 2012, Executive Management released a new set of corporate objectives with weightings for Safe Service (40%), Affordable Service (30%), and Reliable Service (30%).³⁴ As shown in **Exhibit VI-7**, Safe Service includes Safety, Environmental and Compliance categories; Safety itself is weighted 30 percent.

**Exhibit VI-7
RET Weightings**

Corporate Objectives	Impact Groups	Impact Description
Safe Service (40%)	Safety (30%)	A situation or circumstance that may result in an illness, injury, or fatality to employees or the general public.
	Environmental (5%)	Actual or potential threat of adverse effects on living organisms and the environment by effluents, emissions, wastes, resource depletion, etc., arising out of an organization's activities.
	Compliance (5%)	Risks arising from violations of, or nonconformance with, laws, rules, or regulations.
Reliable Service (30%)	Reliability (25%)	Disruption of the company's core business functions (gas and electric delivery).
	Trust (5%)	Risk arising from negative perception on the part of customers, business partners, investors, shareholders, or regulators that can adversely affect the organization's ability to establish business trustworthiness.
Affordable Service (30%)	Financial (30%)	Damage to third party properties, loss of assets and facilities, fines, lawsuits, restitution, remediation, restoration, cost of replacement energy, redistributed customer costs.

Source: DR 40 Attachment 4 – RET Manual.

- The weightings within RET are fixed and used consistently for all risks. The risk weightings are multiplied by the magnitude level of the impact to develop an overall RET Risk Score.³⁵

6. PG&E identified safety-related risks as the top risks in IPP Session D.

- **Exhibit VI-8** shows the top risks identified in 2014, 2015 and 2016.
- The 2015 Session D was the first year that PG&E Senior Officers looked at risk on a company-wide basis.
 - In 2013, the LOB risk managers developed initial risk registers by evaluating their LOB's contributions toward safe, reliable, and affordable gas and electric service and identifying risks to meeting those objectives. During the 2013 and 2014 Session D meeting, Senior Officers discussed their "placemat" risks, which were

³⁴ DR 040 Attachment 004

³⁵ DR 040 Attachment 004

the top risks within each LOB, essentially the top ten or entire risk register, whichever was the greatest.³⁶

- In 2015, the Senior Management Team wanted increased visibility into top company risks and the Session D was constructed to focus on those risks and not necessarily the top risks from every LOB. This meant that all risks that scored above a natural break in the risk register scores would be discussed and in 2014 – this meant all risks that scored 280 or above in addition to any risks that were rated potentially catastrophic (a “7”) in any impact category.³⁷
- The 2016 Session D was very similar to the 2015 session. Again, only top company risks were discussed, with a natural break in scores at 279.³⁸
- From 2014 to 2016, the top safety-related issues have transitioned from system-related items, such as corrosion, to employee and contractor safety.

³⁶ DR 039

³⁷ DR 039

³⁸ DR 039

Exhibit VI-8
Top Risks (Shading Indicates Safety-Related) [Note 1]

	2014 [Note 1]			2015			2016		
	Risk Name	Score	LOB	Risk Name	Score	LOB	Risk Name	Score	LOB
1	External Corrosion (System Safety)	788	Gas Operations	Employee Safety Program	1283	Safety and Shared Services	Employee Safety	983	Safety & Shared Services
2	Welding/Fabrication Related – Pre-1962 Construction with Land Movement (System Safety)	785	Gas Operations	Contractor Safety Program	1283	Safety and Shared Services	Contractor Safety	983	Safety and Shared Services
3	Internal Corrosion (System Safety)	583	Gas Operations	Cyber Security	811	Information Technology	Transmission Pipeline Failure - Rupture with Ignition	975	Gas Operations
4	Manufacturing Related Defects - Older Seam Types (System Safety)	581	Gas Operations	Transmission Pipeline Failure - Rupture with Ignition	807	Gas Operations	Records and Information Management	886	Enterprise Programs
5	Weather Related & Outside Forces – Land Movement (System Safety)	548	Gas Operations	Natural Gas Storage Failure - Loss of Containment with Ignition at Storage Facility	804	Gas Operations	Cybersecurity	811	Information Technology
6	Cybersecurity	432	Information Technology	Wildfire	626	Electric Operations	Natural Gas Storage Failure - Loss of Containment with Ignition at Storage Facility	804	Gas Operations
7	Distribution Overhead Conductor (primary voltage)	408	Electric Operations	Construction Defect with Release of Gas with Ignition on Distribution Facilities	617	Gas Operations	Business Model Risk	771	Regulatory Affairs
8	Employee Safety Program	407	Safety and Shared Services	Comp. & Processing Failure - Release of Gas w/ Ignition at Manned Processing Facility	596	Gas Operations	Changing GHG Regulations	771	Energy Policy and Procurement
9	Customer Affordability	406	Regulatory Affairs	Measurement and Control Failure - Release of Gas with Ignition Downstream	573	Gas Operations	Above-Market Stranded Costs	741	Energy Policy and Procurement
10	Public Access to Conveyance	405	Energy Supply	Failure to Maintain Capacity for System Demands	537	Gas Operations	Failure to Maintain Capacity for System Demands	722	Gas Operations
11	Public Recreation on PG&E Lands/Facilities	405	Energy Supply	Changing Greenhouse Gas Regulations	417	Electric Operations	Wildfire	623	Electric T&D
12	Failure of Substation (Catastrophic)	401	Electric Operations	Conductor Risk (Distribution Overhead Conductor Primary)	408	Electric Operations	Measurement and Control Failure - Release of Gas with Ignition Downstream	596	Gas Operations
13	Wildfire	376	Electric Operations	Failure of Substation (Catastrophic)	401	Electric Operations	Measurement and Control Failure - Release of Gas with Ignition at M&C Facility	573	Gas Operations
14	IT Operational Continuity	340	Information Technology	Insider Threat	401	Finance and Risk	Construction Defect w/ Release of Gas w/ Ignition on Distribution	555	Gas Operations



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BUDGETING AND SPENDING

	2014 [Note 1]			2015			2016		
	Risk Name	Score	LOB	Risk Name	Score	LOB	Risk Name	Score	LOB
15	Cyber Security	335	Energy Supply	Hydro System Safety - Dams	349	Electric Operations	Compression and Processing Failure. Release of Gas with Ignition at Manned Process. Facility	553	Gas Operations
16	Distributed Generation	333	Customer Care	Records Management (proposed enterprise risk)	349	Gas Operations	Over-Generation	437	Energy Policy and Procurement
17	Cybersecurity (owned by IT)	327	Electric Operations	Meter and Mesh Technology Lifecycle	333	Customer Care	Distributed Generation	409	Customer Care
18	Cyber Security	323	Gas Operations	Employee Qualifications	311	Human Resources	Customer Affordability – Rate Design	409	Regulatory Affairs
19	Resource Integration	321	Energy Supply	Loss of Customer Load	298	Electric Operations	Distribution Overhead Conductor Primary	408	Electric T&D
20	Records Management Program (Company-wide)	314	General Counsel	Electric Grid Restoration (proposed enterprise risk)	282	Electric Operations	Failure of Substation (Catastrophic)	401	Electric T&D
21	Third Party/Mechanical Damage (System Safety)	312	Gas Operations	Emergency Preparedness and Response to Catastrophic Events	280	Electric Operations	Hydro System Safety - Dams	349	Generation
22	Hydro System Safety	312 (dam)	Energy Supply	Environmental (Chromium Remediation)	156	Safety and Shared Services	LNG Tanker Third-Party Damage	336	Gas Operations
23	DMS8 - Excavation Damage - CrossBore (System Safety)	310	Gas Operations	Nuclear Operations and Safety - Core Damaging Event	110	Nuclear Generation	Qualified Workforce	336	Human Resources
24	Transmission Overhead Conductors	308	Electric Operations	Business Model Risk	None		Workforce On/Off-Boarding and Monitoring	312	Human Resources
25	Distribution Overhead Conductor (secondary voltage)	308	Electric Operations				Load Loss Risk	311	ExtAffairs and Public Policy
26	Company Compliance Performance	308	Finance and Risk				Meter Technology Lifecycle	311	Customer Care
27	Material or Weld - Plastic (System Safety)	308	Gas Operations				Insider Threat	310	Electric T&D
28	DMS1 - Excavation Damage, Third Party - Rupture At-Fault due to mismarking by PG&E (System Safety)	308	Gas Operations				Transmission Overhead Conductors	310	Electric T&D
29	Control Room Operational Awareness	283	Electric Operations				Motor Vehicle Safety	310	Safety and Shared Services
30	Fairfield Security Control	257	Finance and Risk				Helicopter Operations	308	Safety & SS
31	Emergency Preparedness and Response to Catastrophic Events	247	Electric Operations				Electric Grid Restoration	300	Electric T&D
32	Distribution Underground Cable	245	Electric Operations				Emergency Preparedness and Response to Catastrophic Events	279	Electric T&D

Note 1: 2014 risks are ranked by score in this exhibit despite the fact that the 2014 Session D examined risks at an LOB, not enterprise, level.
Source: DR 039 Attachments 006 to 008; NorthStar analysis.



7. There is some amount of discretion and flexibility in determining the RET scores. The RET scores for many top risks changed significantly during the 2015 Session D (for the 2016 fiscal year). This was the first time that RET scores were ranked across all LOBs.

- **Exhibit VI-9** shows the top risks identified by PG&E before and after 2015 Session D.
 - There are substantial changes in the risk scores, while the list of top risks identified by PG&E remain the same, there are significant changes in their ranking.
 - Employee Safety and Contractor Safety had the most significant change in risk rankings, moving from positions 9 and 10 to positions 1 and 2 following Session D.
 - Although a Nuclear Core Damaging event had a RET score of 110, it was included as a top risk as it was scored as impact level 7 (catastrophic) in Trust and Financial Categories.
- According to PG&E, the scores changed during the 2015 Session D meeting after receiving further PG&E Officer input and calibration.³⁹ LOB calibration sessions were held, as well as an Officer vertical slice calibration.⁴⁰
- The calibration conducted in 2016 for 2017 did not result in significant changes to the RET scores because the calibration exercise in the previous year had been communicated effectively among the LOB SMEs. There were no similar changes to risk scores and rankings in the 2016 Session D meeting. The risks scores listed in the 2016 Session D agenda were the same as the official 2016 Session D top risks.⁴¹

³⁹ DR 639

⁴⁰ DR 039

⁴¹ DR 635 and 316

Exhibit VI-9
Change in Risk Scoring and Ranking During 2015 Session D
 (Highlights Indicate Safety-Related Risk)

#	Risk Ranking Before Session D	Risk Score		#	Risk Ranking After Session D	Risk Score
				1	Employee Safety	1283
				2	Contractor Safety	1283
				3	Cyber Security	811
1	Transmission Pipeline Failure - Rupture with Ignition	807		4	Transmission Pipeline Failure - Rupture with Ignition	807
2	Cyber Security	758				
3	Natural Gas Storage Failure - Loss of Containment with Ignition at Storage Facility	751		5	Natural Gas Storage Failure - Loss of Containment with Ignition at Storage Facility	804
4	Wildfire	626		6	Wildfire	626
5	Measurement and Control Failure - Release of Gas w/ Ignition Downstream	573				
6	Construction Defect with Release of Gas with Ignition on Distribution Facilities	555		7	Construction Defect with Release of Gas with Ignition on Distribution Facilities	617
7	Comp. & Processing Failure - Release of Gas w/ Ignition at Processing Facility	553		8	Comp. & Processing Failure - Release of Gas w/ Ignition at Manned Processing Facility	596
				9	Measurement and Control Failure - Release of Gas with Ignition Downstream	573
8	Failure to Maintain Capacity for System Demands	537		10	Failure to Maintain Capacity for System Demands	537
9	Employee Safety	424				
10	Changing GHG Regulations	417		11	Changing GHG Regulations	417
11	Contractor Safety	409				
12	Conductor Risk (Distribution Overhead Conductor Primary)	408		12	Conductor Risk (Distribution Overhead Conductor Primary)	408
13	Failure of Substation (Catastrophic)	401		13	Failure of Substation (Catastrophic)	401
				14	Insider Threat	401
14	Hydro System Safety - Dams	349		15	Hydro System Safety - Dams	349
15	Environmental (Chromium Remediation)	326				
16	Insider Threat	326				
17	Records Management	312		16	Records Management	349
				17	Meter and Mesh Technology Lifecycle	333
18	Employee Qualifications	311		18	Employee Qualifications	311
19	Meter and Mesh Technology Lifecycle	311				
20	Load Loss Risk	298		19	Load Loss Risk	298
21	Electric Grid Restoration	283		20	Electric Grid Restoration	282
22	Emergency Preparedness and Response to Catastrophic Events	280		21	Emergency Preparedness and Response to Catastrophic Events	280
				22	Environmental (Chromium Remediation)	156
23	Nuclear Operations and Safety - Core Damaging Event	110		23	Nuclear Operations and Safety - Core Damaging Event	110
24	Business Model Risk	None		24	Business Model Risk	None

Source: DR 039 Attachment 007, DR 316 Attachment 001, DR 639, NorthStar Analysis.

8. Each LOB uses different tools and methodologies to develop its Session 1 and Session 2 IPP submissions, but the overall approaches are very similar. The Electric T&D and Gas Operations investment planning processes will be enhanced with the planned implementation of Enterprise Portfolio Planning and Management (EPPM) data management in 2017.

- **Exhibit VI-10** presents a high level overview of the investment planning process used by Electric T&D, Gas Operations, and Power Generation to support the enterprise IPP effort.
- The S-1 and S-2 processes drive the development and implementation of PG&E's operating plan. The LOB S-1s and S-2s are PowerPoint documents that are highly summarized in order to facilitate discussion and decision making at the senior officer level. Underpinning these S-1 and S-2 documents are detailed work plans put together by the LOBs.⁴²
- The calibration of RIBA scores across LOBs helps to ensure that risk elements are treated similarly. Business Finance leads the calibrations of RIBA scores across the LOBs prior to Session 1 and Session 2. The calibration examines comparable scores in the high, medium and lower range for the LOBs, as well as the scoring of similar MWCs or MATs and recurring projects.⁴³
- Power Generation uses a project and portfolio management (PPM) system to maintain its project portfolio and support its planning efforts. Among other things, PPM calculates the RIBA score, and tracks projected and actual costs and project status for projects.⁴⁴ PG&E is currently implementing PPM processes in Gas Operations and Electric T&D.
 - PG&E launched an Enterprise Portfolio Planning and Management (EPPM) initiative about two years ago to help unify the portfolio planning process across Gas Operations and Electric T&D LOBs. Before EPPM, portfolios were planned and managed using individual spreadsheets and in-house LOB-specific systems with no enterprise-wide system of record, no standardization, and no common reporting across PG&E.
 - EPPM will integrate with the project management solution SPSI, a solution deployed in 2015 which integrates SAP Project Systems with Primavera P6.
 - The integration of EPPM and SPSI will expand the portfolio management capability to include project execution data for the portfolio management and portfolio planning lifecycle activities.⁴⁵
 - Electric T&D and Gas Operations are currently piloting the initial release of EPPM ahead of deploying an integrated EPPM-SPSI system. The full integrated launch for Electric T&D and Gas Operations is currently planned for mid-2017.⁴⁶

⁴² DR 311

⁴³ IR 54

⁴⁴ IR 226

⁴⁵ DR 702

Exhibit VI-10
Overview of Operating LOB Annual Investment Planning Process
(Highlighted Rows Indicate IPP Milestone Activities)

	LOB Activity	Enterprise-Wide Activity	Description
January		Executive Guidance	▪ Exec Guidance re: 5-year strategic focus areas
↓		▪ Business Finance issues target LOB budgets	
	▪ Asset Management Plans		
April		Session D – Enterprise Risks	
↓	▪ RIBA Score and Flag Calibrations (No Prioritization)		▪ Asset Owners/Program Leads update RIBA scores, flags and other project data as necessary
		RIBA calibration across LOBs	▪ Ensure LOBs are consistent in RIBA scoring
	▪ Sr. Director Challenge – Prioritize projects		▪ Quality Review
	▪ VP/Directors Prioritization and Approval		
	▪ S-1 Submissions		
July		Session 1 - Enterprise Prioritization/Approval	▪ 5 Year Plan and Metric
↓		S-2 Target Budgets	▪ Business Finance issues target LOB budgets
	▪ Continue to update RIBA Scores and project data. ▪ Examine factors such as: - Resource constraints - Outages - Regulatory		▪ Area Planning meetings in watersheds (Power Generation) ▪ Asset Family Owner Review (Gas Operations) ▪ Program Lead Review (Electric T&D)
		▪ RIBA calibration across LOBs	▪ Ensure LOBs are consistent in RIBA scoring.
	▪ Sr. Director Challenge – Prioritize projects		▪ Quality Review
	▪ VP/Directors Prioritization and Approval		
	▪ S-2 Submissions		
October		Session 2 - Enterprise Prioritization/Approval	▪ 2 Year Plan and Metrics ▪ Resource Plan
↓	▪ Update project data Address deviations and emergent work		
	▪ Prioritization meeting with Directors/VP to balance to targets		
		Final Order Detail Planning	▪ Finance runs the order detail plan in SAP
December	▪ 1 Year budget and Plan		

Source: NorthStar Analysis based on IR 224/225, IR 221/222/223, IR 226 and DR 697 Attachment 002.

9. There is not always a direct connection between the risks identified in Session D and the development of LOB project portfolios.

- The risks identified in Session D do not directly drive the selection of the projects addressed in Sessions 1 and 2. The LOBs generally start the planning process prior to the identification of top risks in Session D. The LOBs' planning is driven by RIBA scoring and other considerations, including those previously listed in **Exhibit VI-10**.
- The RIBA spreadsheets include columns to link to the LOB risk register links, but a review of 2015 and 2016 RIBA score sheets show that these columns are not used.⁴⁷ PG&E states it will refine the RIBA model to further strengthen the link between Session D and Session 1.⁴⁸
- PG&E states that it has and continues to make efforts to improve its risk process and better link Session D to the Session 1 and 2 processes.
 - To strengthen the linkage between Session D and Sessions 1 and 2, starting in 2016 LOBs are required to demonstrate how the LOB work plans are linked to the risks identified in Session D.⁴⁹
 - PG&E began implementing a five-year plan to improve risk quantification in 2016. This plan includes a goal of improving risk reduction values for projects and programs considered in PG&E's investment planning decisions, essentially building a bridge between PG&E's RIBA process and the operational risks in the LOB-specific risk register.
 - According to its five-year Enterprise Risk Management plan, by 2020 PG&E plans to quantify risks to the level appropriate for making risk-informed, alternatives analyses-backed decisions and established risk tolerances in each LOB will enable PG&E to better manage its portfolio of risks.⁵⁰
- PG&E's efforts towards data-driven, risk-based decision-making are tied to the CPUC's RAMP proceeding requirements.
 - PG&E will submit its first RAMP filing associated with the 2020 GRC in November 2017.
 - RAMP will tie mitigations to the risks included in the RAMP and attempt to calculate the risk spend efficiency of the mitigating projects or programs.
 - PG&E will project the estimated dollars and expected effectiveness in reducing risk through mitigating projects and programs. This process will be expanded over time to other risks.⁵¹

⁴⁷ DR 315

⁴⁸ PG&E 2017 General Rate Case Prepared Exhibit PG&E-2

⁴⁹ DR 640

⁵⁰ DR 640, DR 640 Attachment 001

⁵¹ DR 640

- There is also a lack of consistency between RET and RIBA. RIBA uses three impact (or consequence) dimensions versus six in RET:

	RET	RIBA
Safety	x	x
Reliability	x	x
Environmental	x	x
Compliance	x	-
Trust	x	-
Financial	x	-

10. There is not adequate project approval documentation for many safety initiatives that are less than \$20 million. These projects do not require Executive Project Committee review and approval.

- PG&E's Project Approval Procedure requires a detailed business case for projects greater than or equal to \$1 million. The Project Approval Procedure describes project justification requirements based on the estimated cost of the project.
 - Projects less than \$1 million require a job estimate.
 - Projects greater than or equal to \$1 million and less than \$20 million require a defined business case using a Major Project Business Case template (recommended) or a similar document which details.
 - Strategic objective
 - Background
 - Scope, schedule, and milestones
 - Success criteria
 - Strategy for cost recovery
 - Funding or budget status
 - Financial forecast
 - Cost assumptions (e.g. job estimate)
 - Financial benefits, if applicable
 - Economic analysis (i.e., net present value or other comparative analysis of various relevant alternatives)
 - Issues and risks.
 - Projects \$20M and greater must develop a Major Project Business Case for approval describing the project goals, justification, strategy, and scope, and obtain Executive Project Committee review and approval. There is a detailed business case preparation and review process.⁵²
- **Exhibit VI-11** lists safety initiatives that PG&E determined had incremental costs. NorthStar has not reviewed or validated these costs. As shown in the Exhibit, PG&E was unable to provide NorthStar with adequate business case documentation or other project approvals for many safety initiative expenditures.

⁵² DR 206 Attachment 003

Exhibit VI-11
NorthStar Assessment of Project Justification for PG&E Safety Initiatives
Dollars in Millions
(Initiatives without Adequate Project Justification Shaded in Grey)

#	Safety Initiative	2011	2012	2013	2014	2015	Total [Note 1]	NorthStar: Adequate Project Justification?
1	Mariner (Gas Trans GIS system)	\$6.0	\$33.1	\$37.2	\$38.1	\$46.5	\$160.9	Yes
2	New Control Center / Dispatch	-	7.8	48.9	33.2	28.6	118.6	Yes
3	Pathfinder (Gas Dist GIS system)	-	7.5	29.7	33.8	24.0	95.0	Yes
4	Centerline Survey	-	-	61.5	-	-	61.5	Yes
5	Ground Breaking Winters Training Facility	-	0.4	3.6	5.5	19.0	28.4	Yes
6	Launched Enterprise Correction Action Program (CAP)	-	-	0.1	3.2	9.0	12.3	No
7	PAS 55 / ISO 550 Certification API 1173 Certification		1.2	7.5	1.2	0.7	10.6	No
8	Safety Culture ▪ Assessment ▪ Roadmap ▪ Op Leaders Coaching ▪ Safety Governance Structure ▪ SIF Prevention ▪ Field Safety Responsibilities	0.3	-	0.7	1.2	5.6	7.8	Partial See Conclusion 4.
9	Hydro Enterprise Risk Management Gaps Closed	-	2.4	3.0	1.9	0.2	7.5	No
10	Picarro Testing	-	-	-	4.4	-	4.4	Yes
11	RIBA	-	-	1.9	2.4	-	4.3	No
12	Employee Knowledge / Skill	-	-	1.3	1.3	1.3	3.9	Yes
13	Power Generation Lockout-Tagout (LOTO)	-	0.2	1.2	0.3	0.6	2.4	No
14	Telogis	-	-	-	-	1.7	1.7	No
15	Power Generation's Generation Risk Information Tool (GRIT)	-	-	-	1.4	0.1	1.4	No.
16	Ergonomics Office and Industrial	-	-	0.3	1.1	-	1.4	No
17	24/7 Nurse Line Established	-	0.1	0.3	0.4	0.5	1.3	No
18	Contractor Safety Program Established	-	-	0.2	0.5	0.5	1.3	No
19	Gas Operations Daily Calls	-	-	0.1	0.6	0.1	0.9	No
20	Gas Matters Newsletter	-	0.1	0.1	0.2	0.2	0.6	No
21	Driver's Skill / Knowledge	-	-	-	0.2	0.3	0.5	Yes
22	Industrial Athlete	-	0.1	0.1	0.1	0.2	0.4	Yes
23	CAP Mobile Application	-	-	-	0.3	-	0.3	Yes
24	Rapid Incident Notification						.1	No
25	Field Safety Specialists	PG&E did not identify costs of new safety specialists						No

Note 1: Five-year total costs are used in this exhibit to provide a sense of the relative costs of the projects and the need for project justification and expenditure approvals; the five-year totals may not be the total cost of the project. Projects are sorted by five-year total costs.

Source: DR 314 and all attachments, DR 637, DR 612, DR 358. NorthStar Analysis.

- **Exhibit VI-12** lists safety initiatives that PG&E determined had no incremental costs. By definition, there is no business case, project estimate or formal approval for these initiatives.
- While the initiatives listed in **Exhibit VI-12** may not have significant start-up costs, there are costs incurred with the on-going implementation of some of the initiatives. For example:
 - Hands-Free driving policy has productivity impacts.
 - Grass Roots safety teams take time away from work.

Exhibit VI-12
PG&E Safety Initiatives with No Incremental Costs

#	Safety Initiative	Description	Start Date (May be start date of pilot program)	PG&E Explanation of Why Minimal or No Incremental Costs
1	Grass Roots Safety Teams Elect. T&D Gas Ops Power Gen	The Grass Roots Safety Teams are employee-owned/led safety programs that eliminate incidents and share information, ideas, and innovations for the development and improvement of Safety and Health and Wellness programs.	Pre -2011	Grassroots safety team members are PG&E employees who would be employed regardless of their participation on the grassroots safety team.
2	Developed Safety Principles, Commitments and Keys to Life Corp. Safety	In 2011, PG&E replaced its “Rules to Live By” with a more comprehensive and affirmative “Keys to Life”.	Early 2011	There were no additional staffing requirements directly associated with this initiative.
3	Change in Discipline Policy Corp. Safety	PG&E previously relied on incident-based disciplinary actions to deter unsafe behaviors and reconfigured its discipline practices to a behavior-based discipline.	Early 2011	Regular HR department function; costs not tracked separately.
4	Safety Conversations Elect. T&D	The goal of this initiative is to reaffirm Electric T&D's commitment to safety through one-on-one safety discussions with leadership/supervision and each employee.	Mid 2011	There were no additional staffing or third-party resources directly associated with this initiative.
5	Keys to Success Meeting Gas Ops	Gas Operations holds an all-day, monthly meeting called the “Keys to Success” meeting. Attendees include officers and directors within Gas Operations as well as leaders from key support organizations.	Summer 2011	The Keys to Success (Keys) meeting participants are PG&E employees who would be employed regardless of their participation in the Keys meetings.
6	Gas Operations Risk and Compliance Committee Gas Ops	The Gas Operations Risk and Compliance Committee meets monthly and reviews and approves Session D materials in addition to monitoring compliance and risk management activities.	Sept. 2011	Meeting participants are PG&E employees who would be employed regardless of their participation in the meetings.

#	Safety Initiative	Description	Start Date (May be start date of pilot program)	PG&E Explanation of Why Minimal or No Incremental Costs
7	Reach Every Employee Elect. T&D	The Reach Every Employee (REE) Initiative was created to improve communication between management and bargaining unit employees. Each supervisor is to have a one-on-one discussion with his direct reports regarding the REE document.	Late 2011	This initiative consists of reviewing a message about employee and leadership safety expectations with each employee and signing an agreement that both parties are committing to the agreement.
8	Electric Operations Safety Council Elect. T&D	The Electric Operations Safety Council develops the department's safety philosophy and strategy, approves department safety initiatives, removes barriers to success; identifies items for escalation to the Safety and Risk Committee, promotes safety culture, and assures continuous improvement in safety performance. The Safety Council also provides an avenue for grassroots leads to elevate issues.	Late 2011	This is a monthly meeting with action items. There are no additional costs associated with holding this meeting.
9	Enterprise Near-Hit Program Corp. Safety	Near-hit sharing, used in a preventive, non-punitive manner, can potentially reduce employee, contractor, and public safety incidents and injuries. This approach can also help create a safety climate where we employees and contractors look out for one another and prevent incidents from occurring to co-workers, contractors, and the public.	Mid 2012	There were no additional staffing or third-party resources directly associated with this initiative.
10	Kickoff of Safety Leadership Workshops Corp. Safety	These workshops took place following the San Bruno incident to ensure all leaders understood the safety direction PG&E was taking and the new expectations of leaders as part of that direction. These workshops were designed to provide leadership with practical information and guidance to increase their competence and confidence to be a good safety leader.	Mid 2012	There were no additional staffing or third-party resources directly associated with this initiative.
11	Wires Down Reporting Elect. T&D	PG&E began development of the "Wires Down" metric in 2011, escalating it to a company metric in 2012. The program is set up so that wire down reports are recorded appropriately in the outage reporting system. Work plans are developed through the investigation process that supports the prevention of re-occurrence and overall reduction of wires-down.	Late 2012	The establishment of wires down reporting was managed by existing PG&E staff.
12	Eight Gas Asset Families Gas Ops	Gas Operations completed comprehensive asset management plans for each of the eight asset families.	Mid 2013	The eight asset family owners and their teams are PG&E employees who would be employed regardless of dividing the assets into asset families.

#	Safety Initiative	Description	Start Date (May be start date of pilot program)	PG&E Explanation of Why Minimal or No Incremental Costs
13	Truck Rodeos Elect/ T&D	Truck Rodeos were developed and are run by the Grass Roots Safety teams to conduct peer truck and tool inspections and ensure company vehicles are in safe operating condition. Grass Roots Safety teams schedule truck rodeos and bring all vehicles through a series of stations. These stations focus on a variety of different things including tool/housekeeping inspections as well as hands-on behind-the-wheel exercises that raise awareness on the footprint and handling of an employee's individually assigned company vehicle.	Late 2013	There are costs associated with the trailer and supplies. The trailer is a monthly charge from fleet (approx. \$200).
14	Standard Roles and Responsibilities Established in Field Safety Corp. Safety	PG&E recognized a need to increase the skills and knowledge of the corporate safety specialists. PG&E identified a technical safety knowledge and leadership gap amongst Corporate Safety Delivery safety specialists and LOB. A new safety operating model was created using benchmarking and past business results to ensure consistency and visibility among Field Safety.	Mid 2014	There were no additional staffing or third-party resources directly associated with this initiative.
15	911 Standby Response Elect. T&D	Electric T&D centralized the control and handling of 911 response calls for events such as downed power lines. The intent was to free up emergency services providers as quickly as possible so they could focus on public safety.	Mid 2014	There were no additional staffing or third-party resources directly associated with this initiative.
16	Super Gas Ops/Super Crew Gas Ops	"Super Gas Ops" is a change in the way work is organized, dispatched, and executed in Gas Operations. PG&E also created a process optimization pilot team known as the "Super Crew."	May 2014	The work is on-going program work and costs for that work are charged to the gas distribution programs and not associated with the initiative.
17	AGA Peer Review Gas Ops	PG&E participates in peer reviews with other AGA members.	Late 2014	Gas Operations employees who participate in the AGA Peer review meetings are PG&E employees.
18	Safety Re-Organization to include Health and Environment Corp. Safety	In 2011, PG&E began several workforce health initiatives including the Industrial Athlete program, 24/7 Nurse Report Line, and forthcoming initiatives such as On-Site Healthcare and Clinics. PG&E combined the Workforce Health team in Human Resources with the Corporate Safety team in Shared Services to better link these efforts.	Late 2014	There were no additional staffing or third-party resources directly associated with this initiative.
19	Corporate Safety Service Level Agreements (SLAs)	Corporate SLAs were developed to clarify the partnership and division of duties between the Corporate Safety Department and the LOBs.	Late 2015 Early 2015 Late 2015	There were no additional staffing or third-party resources directly associated with this initiative.

#	Safety Initiative	Description	Start Date (May be start date of pilot program)	PG&E Explanation of Why Minimal or No Incremental Costs
20	Safety Index in Premier Survey Corp. Safety	At an enterprise level, the Premier Survey provides insight about employee sentiments of priorities such as safety, efficiency, customer focus, continuous improvement, empowerment, engagement, ethics and compliance.	Early 2016	There were no additional staffing or third-party resources directly associated with this initiative.
21	Power Generation Facilitative Leadership and Crucial Conversations Power Gen	Facilitative Leadership is a two-day training course to: 1) develop skills and tools for tapping the creativity, experience, and commitment of the people with whom you work, and 2) provide a forum to explore challenges and aspirations as a leader. Crucial Conversations® is a two-day training course to teach skills to foster open dialogue around high-stakes, emotional, or risky topics.	Mid 2016	This initiative leveraged the experience of the Nuclear organization. There were no additional staffing or third-party resources directly associated with this initiative.
22	Phone-Free Driving Commitment Corp. Safety	Under the standard, employees are prohibited from using cell phones (except under limited emergency exceptions) while driving on company business or while driving a company-owned or leased vehicle unless they are stopped in a safe and legal parking location.	2016	There were no additional staffing or third-party resources directly associated with this initiative.

Source: DR 314 Attachment 001, NorthStar Analysis.

11. There is limited documentation for the review and approval of the Safety Culture Initiative funding, and there are discrepancies in reported expenditures through 2015.

- In 2013, a consultant performed safety culture assessments to identify areas of opportunity for PG&E to improve its safety culture. Based on this baseline assessment, in May 2014 PG&E, with support from the consultant, developed a safety culture roadmap that included the following items:
 - Operational leaders participating in series of six workshops, 360-degree feedback assessments, and one-on-one safety coaching
 - Standard roles and responsibilities established in field safety
 - Enhanced safety governance structure
 - SIF prevention program
 - Officer and director coaching.⁵³
- As shown in **Exhibit VI-13**, the safety culture initiative received funding approval through both the routine S&SS S-2 process, and the FPC process to fund emergent

⁵³ DR 659

work. NorthStar's review of FPC approval documentation indicates that Safety Culture was the only safety initiative funded outside the IPP process.⁵⁴

Exhibit VI-13
Safety Culture Initiative Funding Approvals
Session 2 and FPC Approvals

	Budget Year				Description	NorthStar Comments
	2013	2014	2015	2016		
S-2 Funding Approvals						
2013		TBD			S-2 states Safety Culture part of \$16.9M Safety Dept. costs. 2014 costs to be determined (TBD)	
2014			?			S-2 unclear re: additional funding for 2014. NorthStar found no FPC approval for \$8.6M for 2015
2015				\$7.1	Safety Culture forecast \$7.1 M in 2015; \$6.0M in 2016.	
FPC Funding Approvals						
6/7/2013	\$1.0				In-Flight Safety Leadership Workshops and Safety Engagement Program	E-mails document funding approval. FPC presentation not provided for NorthStar review
9/18/2013	\$1.2				Safety Culture Change and Road Map	E-mails document funding approval. FPC presentation not provided for NorthStar review
6/6/2014		\$6.4				FPC Presentation includes appropriate business case information.
NorthStar Unable to Verify Funding Approved						
?			\$8.6		The 2014 S-2 states Safety Culture was funded outside of the original budget (\$6.4M in 2014 and \$8.6M in 2015).	NorthStar was not provided with documentation demonstrating FPC approval.
Total Funding Approved						
Total	\$2.2	\$6.4	\$8.6	\$7.1		

Source: DR 039 Supplement 001 Attachments 036-CONFIDENTIAL, 046-CONFIDENTIAL and 057-CONFIDENTIAL; DR 637 Attachments 001 to 3; DR 314 and All Attachments.

- While the S&SS S-2 presentations provide summary-level information about the objectives of the initiatives included in the safety culture roadmap, they do not provide detailed business case-level justification for funding approvals. Moreover, the 2013 S-2 presentation states the forecast 2014 expense are "TBD" and the 2014 S-2 presentation does not specify the amount requested for the safety culture initiatives.⁵⁵

⁵⁴ DR 637 Attachments 001 to 003.

⁵⁵ DR 039 Supplement 001 Attachment 026-CONFIDENTIAL and DR 039 Supplement 001 Attachment 046-CONFIDENTIAL

- Although e-mails and SS&S S-2 presentations state that the safety culture roadmap received FPC funding approval on four occasions, NorthStar received only one Safety Culture presentation to the FPC in response to its data requests. The May 27, 2014, presentation to the FPC for safety culture roadmap program funding contains adequate business case information for funding approval.
- There are discrepancies in the safety culture roadmap costs reported by PG&E. **Exhibit VI-14** compares the costs tracked in the planning orders and the costs provided by PG&E in response to a data request.⁵⁶

Exhibit VI-14
Safety Culture Initiative
Actual Costs per Planning Orders and PG&E's Data Response
(\$ Millions)

		2011	2012	2013	2014	2015	Comment
Planning Order Actuals							
Order	Description						
5017478	COO - SH&E-Public Safety Support	0.1	0.0	0.5	0.5	1.9	
5241753	Life Safety Supplies	-	-	0.1	0.1	-	
5241719	Safety Culture Roadmap	-	-	1.2	4.2	7.4	
	Total	0.1	0.0	1.8	4.8	9.4	
PG&E Data Response							
	Safety Culture Assessment	0.3	-	0.7	-	-	
	Engaged Consultant on Safety Roadmap	-	-	-	0.3	-	
	Op Leaders Safety Coaching	-	-	-	0.7	5.0	
	Enhanced Safety Governance Structure	-	-	-	0.7		Estimated cost in 6/2014 FPC presentation
	SIF Prevention Program	-	-	-	0.3	0.6	
	Officer and Director Coaching	-	-	-	1.1		Estimated cost in 6/2014 FPC presentation
	Total	0.3	-	0.7	3.0	5.6	
Difference							
	Difference	(0.1)	0.0	1.1	1.8	3.8	

Source: DR 314 Attachment 1, DR 659, DR 612 Attachment 001.

D. RECOMMENDATIONS

- Develop a method of separating “safety” expenditures from routine reliability and integrity expenditures. This may occur as part of the CPUC’s RAMP process.
- Develop business case support and a record of management approval for safety initiatives in accordance with PG&E’s Project Approval Procedure.

⁵⁶ DR 659 and DR 314

3. Develop a method for weighting the value of management initiated safety programs comparable to RIBA but focused on management and training.
4. Move forward with planned implementation of the Power Generation IPP PPM system for all operational LOBs.
5. Continue efforts to better link IPP Session D to the Session 1 and 2 processes.

CHAPTER VII: COMPENSATION AND PERFORMANCE MANAGEMENT

This chapter provides the results of NorthStar's review of PG&E's compensation and performance management programs, including the use of metrics or Key Performance Indicators (KPIs), and their effectiveness in driving improved safety performance. NorthStar recognizes that it is difficult to quantitatively measure culture.

A. BACKGROUND

Compensation

PG&E has a pay-for-performance approach to compensation. Compensation components include: base pay, a short-term incentive program (STIP) – effectively an annual bonus program, a long-term incentive program (LTIP), health and welfare benefits, and retirement benefits. The largest component of most employees' compensation is their base pay. Safety is included in an employee's job responsibilities and required qualifications, and in their individual goals and competencies. Performance is evaluated based on achievement of goals, as well as how the goals are achieved.

STIP

Executives, non-represented employees and certain professional, represented employees participate in STIP.¹ STIP is designed to provide a link between pay and company performance. All non-participants have a leader that participates in STIP.² In 2016, the STIP "score" was based on 12 measures, some of which were a composite of other measures.³ **Exhibit VII-1** (following page) provides the STIP measures and actual performance for 2015, and targets for 2016. Nine of these measures are considered safety-related. Safety represents 50 percent of the total STIP.

Each STIP measure has a threshold, target, and maximum level of performance used to arrive at a score ranging from zero to 2.0 for that measure. Performance below the minimum performance level, or threshold, results in a zero score. Performance at the threshold results in a STIP score of 0.5. Achieving target results in a STIP score of 1.0, and performance at or above the maximum established level results in a score of 2.0. A score of 1.0 provides 100 percent of an individual's target payout. Performance at the threshold and maximum levels delivers 50 percent and 200 percent of targeted payouts, respectively. Linear interpolation is used to determine scores for performance between threshold and target, and between target

¹ About 10,000 employee participate in STIP

² DR 004 Attachment 008, IR 7

³ DR 004 Attachment 008

and maximum. The STIP overall performance score is the sum of the weighted cumulative average scores for performance on each of the STIP measures.⁴

The amount an employee can earn varies, based on the employee's salary band (i.e., 6 to 30 percent of base salary for non-officer employees). Leaders may modify an employee's STIP payout – up or down, based on the employee's individual performance. In its recent GRC, PG&E sought rate recovery of STIP payouts for its non-executive employees only.⁵ Executive employee STIP payments were shareholder-funded.

Exhibit VII-1
2015 STIP Performance and 2016 Targets

	Measurement	2015 Target	2015 Perf	STIP Score	Weighted Average Score	2016 Target
Safety (50%)						
Public Safety						
<i>Energy Supply</i>						
DCPP Reliability Indicator Unit 1 (4%)	Composite of 12 nuclear industry lagging indicators	94.2	99.44	2.000	0.080	98.70
DCPP Reliability Indicator Unit 2 (4%)	Composite of 12 nuclear industry lagging indicators	94.2	99.83	2.000	0.080	98.70
<i>Electric</i>						
T&D Wires Down (5%)	Number of Incidents	2,540	2,572	0.787	0.039	2,572
911 Emergency Response (5%)	Percent of time on site within 60 minutes	95%	97.14%	2.000	0.100	97.5%
<i>Gas</i>						
Gas Dig-In Reductions (5%)	Incidences per 1,000 Underground Service Alerts	2.06	2.11	0.896	0.045	2.03
Gas Emergency Response (5%)	Average Response Time	21.0	20.33	1.670	0.084	21.0
In-Line Inspection and Upgrade (6%)	Ability to complete planned inspections and pipeline retrofit projects. Weight of miles inspected and replaced	1.0	1.52	1.520	0.091	1.0
Employee Safety						
Lost Work Day Case Rate (8% - 2015, 6% - 2016)	Number of lost workday cases incurred per 200,000 hours worked (or for approx. every 100 employees). 0.25 may be added for zero serious incidents	0.330	0.372	0.000	0.000	0.320
Serious Preventable Motor Vehicle Incident (SPMVI) Rate (8% - 2015, 6% - 2016)	Number of SPMVIs that the driver could have reasonably avoided per 1 million miles driven	0.239	0.266	0.614	0.049	0.239
Timely Reporting of Injuries (new 2016)	Percent within 24 hours					67.1%

⁴ 2016 Proxy Statement, www.pgecorp.com

⁵ DR 565 Attachment 001 (2017 GRC Late Filed Exhibit on Executive Compensation and Safety, Exhibit (PG&E-43))

	Measurement	2015 Target	2015 Perf	STIP Score	Weighted Average Score	2016 Target
Customer (25%)						
Customer Satisfaction Score (15%)	As measured through a quarterly survey	77.2	75.5	0.000	0.000	75.7
System Average Interruption Duration Index (SAIDI) (10%)	Total time an avg. customer is without electricity during a given time period in minutes	106.6	96.33	2.000	0.200	96.30
Financial (25%)						
Earnings from Operations (EFO) \$M		Budget	\$1,518.87	1.763	0.449	Not disclosed
					1.217	

Source: 2016 Joint Proxy Statement, DR 565 Attachment 001 (2017 GRC Late Filed Exhibit on Executive Compensation and Safety, Exhibit (PG&E-43)).

LTIP

Officers, directors and some managers/professionals participate in LTIP. LTIP is completely shareholder-funded. Performance shares comprise 60 percent of the LTIP; the remaining 40 percent are in Restricted Stock Units (RSUs) that vest over three years – generally one-third at the end of each year of the vesting period.⁶ Fifty percent of the LTIP is performance shares that pay out in a range from 0 to 200 percent based on PG&E Corp.'s Total Shareholder Return (TSR) over a three-year period (at the end of the three year period), and 10 percent of the LTIP is performance shares using equally weighted safety and affordability measures. TSR is the total return of a stock to an investor, or the capital gain plus dividends. TSR is the internal rate of return of all cash flows to an investor during the holding period of an investment. In 2012, 2013 and 2014 there was no payout for the performance shares granted in 2009, 2010 and 2011, as PG&E's TSR was at the bottom of its comparator group.⁷ For shares granted in 2015, the comparator group consisted of 14 companies that are consistently considered by the investment community as regulated rather than less regulated and with a market capitalization of at least \$4 billion. The 2015 payout (for shares granted in 2012) was 35 percent and the 2016 payout (for shares granted in 2013) was 50 percent. RSUs pay out each year and are based on stock price.

Compensation Committee

The Compensation Committee of the PG&E Corp. Board advises and assists the PG&E Corp. and PG&E Boards with the compensation of Directors; certain policies and practices regarding employment, compensation, and benefits; and the development, selection, and compensation of policy-making officers. The Compensation Committee reviews and approves the corporate goals and objectives of the CEO, and evaluates his/her performance; provides recommendations to the full Board regarding the CEO's salary and other compensation; and reviews and acts on the recommendations of the CEO concerning salaries

⁶ 2016 Proxy Statement, www.pgecorp.com

⁷ DR 006-CONFIDENTIAL, DR 565 Attachment 001

and other compensation of all other officers of PG&E Corp. The Committee retains a compensation consultant that provides annual input on compensation levels and trends.⁸

The Committee reviews and approves the STIP and LTIP structures; approves or modifies the STIP score; and determines the payouts under the LTIP. The NOS Committee also reviews the annual STIP structure, including the weightings and proposed metrics and provides feedback to the Compensation Committee.⁹

Performance Management

In addition to the STIP metrics, PG&E tracks a number of other safety and performance metrics. These are discussed in various LOB business update meetings, at each LOB's Safety Council and the monthly enterprise Business Performance Review. Operations and safety-related metrics are also presented to the NOS Committee.¹⁰ In Session 1 of the IPP (discussed in **Chapter VI: Budgeting and Spending**) each LOB develops goals based on the Executive Guidance provided in Session D and the five-year plan. The product of Session 2 provides the KPIs for each goal area and the associated five-year targets. PG&E refers to these KPIs as the "BPR" metrics as they are discussed in the monthly Business Performance Reviews (BPR). Each LOB (Gas Operations, Electric T&D, Generation, Energy Policy & Procurement, Customer Care, IT, S&SS, Human Resources, External Affairs and Public Policy, Regulatory Affairs, Finance and Risk, General Counsel, Compliance) has roughly 20 to 30 BPR metrics. The BPR process also includes a review of Enterprise Programs and Safety Metrics (27 metrics in 2016).¹¹

Exhibit VII-2, on the following page, provides an example of how the goals cascade into metrics, based on Electric T&D. The exhibit provides all metrics but only a small, illustrative sample of S-1 goals. A portion of the BPR metrics are also included as part of PG&E's STIP and, more recently, its LTIP.

⁸ DR 008 Attachment 015, Compensation Committee Charter, DR 006-CONFIDENTIAL (Review of Compensation Committee Materials and Meeting Minutes)

⁹ DR 565

¹⁰ DR 767 Attachment 003

¹¹ DR 665 Attachment 001

Exhibit VII-2
Cascading Goals and Metrics Example – Electric T&D

Goal	Contributing to Goal (S-1) Examples	2017 BPR Metrics
Public Safety	Zero Public Safety Incidents <ul style="list-style-type: none"> 1st Quartile 911 Response by 2017 1st Quartile T&D Wires Down by 2018 Engage customers about safety to prevent public contacts 	<ul style="list-style-type: none"> 911 Response (STIP) Electric Overhead Conductor Index (STIP) Proposed Fire Ignitions T&D Wires Down
Workforce Safety	Reduce safety incidents while eliminating serious incidents and fatalities <ul style="list-style-type: none"> 1st Quartile LWD Case rate – 2018 Create a “speak up” culture and climate of trust 	<ul style="list-style-type: none"> LWD Case Rate/Count Serious Preventable Motor Vehicle Incident Rate/ Count Timeliness of Reporting of Injuries
Compliance	Leverage our compliance framework to strategically identify and close gaps <ul style="list-style-type: none"> Establish “Find It First” control testing Implement CAP to identify and mitigate emergent issues 	<ul style="list-style-type: none"> Compliance Mitigations Complete
Emergency Preparedness and Response (EP&R)	Respond to all emergencies safely, quickly, and transparently to meet the needs of the communities we serve <ul style="list-style-type: none"> Continue to develop an all hazards approach to emergency preparedness Analyze the Enterprise Risk list to analyze capabilities 	<ul style="list-style-type: none"> EP&R Maturity Level (out of 5)
Reliability	Improve system reliability <ul style="list-style-type: none"> Maintain 2nd Quartile SAIDI & SAIFI through 2021 Incorporate voice of the customer feedback into reliability decisions 	<ul style="list-style-type: none"> SAIDI (STIP) SAIFI CEMI5
Affordability	Operate efficiently to deliver electricity cost effectively <ul style="list-style-type: none"> Achieve targeted efficiency savings through 2021 and meet pessimistic financial target guidance Deploy technology enhancements 	<ul style="list-style-type: none"> ET&D Expense Spending ET&D Capital Spending ET&D Expense Efficiencies ET&D Capital Efficiencies
Customer Satisfaction	Industry leading customer satisfaction <ul style="list-style-type: none"> 2nd Quartile – Customer Satisfaction Score: Reliability by 2018 Meet customer commitments by improving work flow management 	<ul style="list-style-type: none"> Customer Commitments Met
People	Lead, engage and develop our workforce <ul style="list-style-type: none"> Achieve and maintain 2nd Quartile score on the Premier Survey by 2018 Address capacity constraint issues – development opportunities 	<ul style="list-style-type: none"> Tracked through Premier Survey

Note: Metrics highlighted in yellow are compared against a benchmark panel.

Source: 2016 S-1 and S-2 – CONFIDENTIAL.

Each year Gas Operations goes through a similar process and develops a “Line of Sight Goals” booklet for its employees that summarizes each department’s goals and generally ties these goals to the overall goals identified in the S-1 process. **Exhibit VII-3** shows the relationship between the 2016 S-1 goals, BPR metrics, and the Line of Sight goals for a representative department, Gas T&D Construction.

On an annual basis, Power Generation develops a Safety Action Plan, outlining its activities to improve public and employee safety. The action plan is reported to the Generation Safety Council on a monthly basis. Initiatives have milestones, owners and associated metrics. Multiple initiatives may be aimed at moving one metric.¹²

¹² DR 093 Attachment 001

Exhibit VII-3
Example of Relationship of Gas Operations S-1 Goals and Metrics to Line of Sight
Goals (Gas T&D Construction)

Goal	2016 BPR Metrics	Department Goals [Note]
S-1 Goals		
Public Safety	<ul style="list-style-type: none"> Gas Dig-Ins Reduction Gas Emergency Response In-line Inspection Index Grade 2 and 2+ Leak Backlog Shut in the gas – Average times – Mains & Services CAP Engagement Legacy Cross Bore Inspection Distribution Main Replacement 	<ul style="list-style-type: none"> Execute construction work safely Ensure our assets are left in safe condition after work completed Embed safety principles into the execution of Gas T&D Construction work Support emergency response and preparedness Promote a learning culture, using CAP Reinforce a strong safety culture/Promoting wellness and injury/accident free use the 24/7 Nurse Helpline Recognize and encourage employees to model safety behavior and improve public safety
Workforce Safety	<ul style="list-style-type: none"> Employee LWD Case Rate SPMVI Case Rate 	
Reliability	<ul style="list-style-type: none"> Distribution Network % SCADA visibility Large Over Pressure Events 	<ul style="list-style-type: none"> Ensure system reliability through timely clearance submission and adherence Ensure qualification of workforce and adhere to standards and procedures Support quality management systems
Affordability	<ul style="list-style-type: none"> Average Time for Main Leak Repair Average Time for Service Leak Repair 	<ul style="list-style-type: none"> Implement process improvements Develop clear targets that measure Gas T&D Construction performance Improve cost tracking SAP, new Cost Model
Employee Engagement	<ul style="list-style-type: none"> CAP engagement 	<ul style="list-style-type: none"> Partner with other LOBs re: enterprise-wide opportunities to support one PG&E. Enhance workforce and contractor strategic alliances and partnerships with IBEW and ESC Career development opportunities, recognition, timely communications, feedback from Premier Survey
Customer Satisfaction	No BPR Metrics Tracked and Assessed through Session D and Session 1	<ul style="list-style-type: none"> Continue to re-build customer trust by improving the safety of the system. Support new market development through timely completion of new business work.
Mitigate Top Risks	<ul style="list-style-type: none"> Risk Mitigation 	<ul style="list-style-type: none">
Path to Notices of Violations	<ul style="list-style-type: none"> Quality Index Compliance Mitigation Mandatory Training 	<ul style="list-style-type: none">
Not in S-1		
Compliance		<ul style="list-style-type: none"> Inspections and records reviews Timely completion of training, operator quals for work performed, calibration of tools Enhance records quality

Note: NorthStar summarized the department goals for the purpose of this exhibit.

Source: DR 39 Supplement 001 Attachment 053-CONFIDENTIAL; DR 080 Attachment 001.

B. EVALUATIVE CRITERIA

- Has PG&E identified measurement parameters of safety cultural strategy change to determine progress or identify necessary changes? Is the measurement on-going?
- Does management measure the results of the various safety initiatives and their contribution to goal achievement?
- Are links between safety performance and compensation appropriate at the various levels within the organization?
- Do the Board of Directors and executive leadership hold themselves and management accountable for their decisions and actions which may impact safety or PG&E's safety culture?
- Does the Company conduct best practices benchmarking assessments? Is there a sharing of best practices within the various organizations within PG&E on safety culture strategy and implementation?

C. FINDINGS AND CONCLUSIONS

1. PG&E has identified metrics it intends to use to measure cultural change; however, a safety culture index or final metric has not yet been developed. As many initiatives are in their infancy, the effectiveness of the potential safety culture measures cannot yet be assessed. Some metrics may prove more useful than others.

- PG&E proposes to measure safety culture progress through the methods described below.¹³ NorthStar was not provided information on specifically how these measures will be used nor the associated KPI definition/lexicon, as PG&E had not yet developed a formal measurement process.
 - The Organization Culture Diagnostic Instrument (OCDI) Survey. A survey-based baseline assessment of safety culture performed by a third-party in 2013 (results were provided in 2014). PG&E intends to perform the survey again in 2017 to assess progress. It is unclear whether this will actually be performed as the initial survey was performed by a third-party.
 - Numbers of leaders completing Safety Leadership Development workshops. These workshops are intended to improve the environment and conversations between leaders and their teams, to encourage employees to speak up if they see issues. PG&E currently tracks this.¹⁴ The Safety Leadership Development workshops are discussed in detail in **Chapter VIII: Training**.

¹³ DR 225

¹⁴ DR 225 and Attachments 001-002

- Near Hit Reporting. The intent of the Near Hit Program is to increase awareness of potential safety issues, increase dialogue and mitigate risks, thus preventing, as opposed to responding to, incidents. PG&E currently tracks the number of reported near hits.¹⁵ The Near Hit Program is discussed in detail in **Chapter X: Safety Reporting/Corrective Action**.
 - The Corrective Action Program. Similar to the Near Hit Program, CAP allows employees to identify potential safety, process or other issues, so that items can be resolved before creating a potential safety incident. PG&E currently tracks this.¹⁶ CAP is discussed in detail in **Chapter X: Safety Reporting/Corrective Action**.
 - The Premier Survey. The Premier Survey is PG&E's most comprehensive employee survey. Currently it is conducted every two years and covers a variety of topics including elements of safety culture. The Premier Survey is discussed in detail in **Chapter IX: Communications**.
- **Exhibit VII-4** provides a discussion of each of the proposed measures.

Exhibit VII-4
NorthStar Discussion of Proposed Safety Culture Measures

Culture Measure	Discussion
Safety Leadership Development Workshop Program Throughput	<ul style="list-style-type: none"> • Training hours or throughput are used by other utilities to measure safety. • Measures input only, not results or effectiveness. • Change in the structure, format or time required for training may cause a jump in performance depending on how the measure is calculated.
Near Hit Program	<ul style="list-style-type: none"> • Includes non-work events. If volumes of reported near hits become burdensome from a cost standpoint the reporting requirements may change which would result in an inconsistent basis for measurement. • Employees may be unclear on the distinction between Near Hits and CAP items. Use of both as a measure requires proper classification. An aggregate measure may provide more consistent reporting.
CAP	<ul style="list-style-type: none"> • Program in its infancy. Will not be rolled out to all business units until 2017. As a result, counts will increase as new LOBs are added, not necessarily from increased use. • If the number of reported CAP items becomes burdensome from a cost standpoint the reporting requirements may change which would result in an inconsistent basis for measurement. • Issues reported in CAP may belong in other reporting systems. As employees better recognize the difference and report to the proper system, this might skew results. • Employees may be unclear on the distinction between Near Hits and CAP items. Use of both as a measure requires proper classification. An aggregate measure may provide more consistent reporting.

¹⁵ DR 225 and Attachments 001-002

¹⁶ DR 225 and Attachments 001-002

Culture Measure	Discussion
Premier Survey	<ul style="list-style-type: none"> • Participation levels are high, which is positive. • Currently only conducted every two years. Premier with a pulse survey might provide more timely information. • Although a general sense of safety culture can be obtained based on similar questions, the survey questions have changed year over year thus providing an inconsistent basis for evaluation. • Surveys are subjective measures and employee responses can be driven by a number of factors including the timing of the survey.
OCDI Survey	<ul style="list-style-type: none"> • See discussion above regarding surveys. • This survey was conducted four years ago. Performing a survey every four years does not allow for timely identification and correction of issues. • The results are complicated and difficult to interpret. • Potentially costly as it was performed by a third-party. Likely difficult to replicate. If it was based on in-person interviews that adds additional, potentially biasing factors. • Responses to certain of NorthStar's data requests indicate that the performance of a second OCDI survey is not guaranteed.

Source: DR 225, NorthStar Analysis, DR 048 b, DR 257 (OCDI survey).

- PG&E is currently developing a Safety Management System (SMS) to enhance its ability to monitor and assess safety performance and culture. As the SMS is in the early stages of development, NorthStar cannot assess it or its ability to measure culture change.¹⁷ Proposed KPIs to be tracked through the SMS are the same as those that are currently tracked and do not specifically measure safety culture.¹⁸
- PG&E conducts 360-degree feedback assessments of supervisors and superintendents as part of the Safety Leadership Development Program.¹⁹ Conducting these periodically or having employees evaluate the safety performance of their supervisors/leaders might be used to assess progress in changing culture. Other possible measures include independent observation of positive behaviors or appropriate safety coaching.

2. Some of PG&E's various safety initiatives have direct measures of performance; however, most do not. Generally, multiple initiatives may affect one measure. Examples are provided below.

- PG&E tracks the number of Near Hits and CAP submittals, the number of anonymous submittals, the percentage of the work force reporting CAP items, submittal backlogs, response times and closure rates. These measures are specific to the programs, and measure the adoption of the programs. The CAP and Near Hit submittals are also used as a measure of culture change.
- There are several programs designed to reduce MVIs and SPMVIs. The intent is that these programs will reduce incidents, but a reduction cannot be attributed to an individual initiative or effort.

¹⁷ DR 255, DR 257

¹⁸ DR 257

¹⁹ DR 257

- PG&E tracks the calls to its 1-800 driver check line. According to PG&E, a driver reported more than once is more likely to end up in an MVI. Some supervisors provide special counseling to these drivers.
 - Telogis provides statistics on unsafe driver behavior such as speeding and harsh breaking.
 - Field interviews indicate that some of the field offices examine what time the MVIs occurred in order to devise ways to reduce accidents at those specific times.
 - PG&E also has driver training and rodeos.
- PG&E measures the timeliness of the reporting of injuries to the 24/7 Nurse Report Line, but has no way of knowing if the employee followed the recommended course of action (e.g., self-care). According to PG&E, early intervention has been shown to reduce the severity and duration of injuries. However, PG&E cannot confirm the call led to early intervention. On-site physical therapists provide more direct early intervention.
 - The Industrial Athlete Program, the 24/7 Nurse Report Line, changes in tools, ergonomic programs and procedures, and on-site physical training are all designed to reduce injuries. Injury statistics like LWD, DART and OSHA Recordables should improve as a result of these initiatives, but it is difficult to determine what specifically contributed to the improvement. JHAs, increased awareness or focus on job safety, and numerous other variables may contribute to reduced injuries.
 - Gas Dig-In Reductions measures the effectiveness of PG&E's efforts to reduce third-party dig-ins. The Gas Dig-In Reductions measure is also used as a public safety KPI. In this case Gas Dig-Ins are used as both a leading and lagging indicator. Leading indicators provide information about the current situation that may affect future performance. Used properly, leading indicators help an organization respond to changing circumstances and take actions to achieve desired or to avoid unwanted outcomes. Lagging indicators measure outcomes that have resulted from past actions.

3. There are links between safety performance and compensation at most organizational levels.

- Bargaining unit employees do not receive performance-based bonuses.²⁰ Although front-line employees can be one of the greatest drivers of safety, it is challenging to develop a metric that does not potentially foster unwanted behavior.²¹
- To encourage reporting and discourage immediate supervisors from pressuring employees, PG&E stops the cascading of certain quantitative goals at an

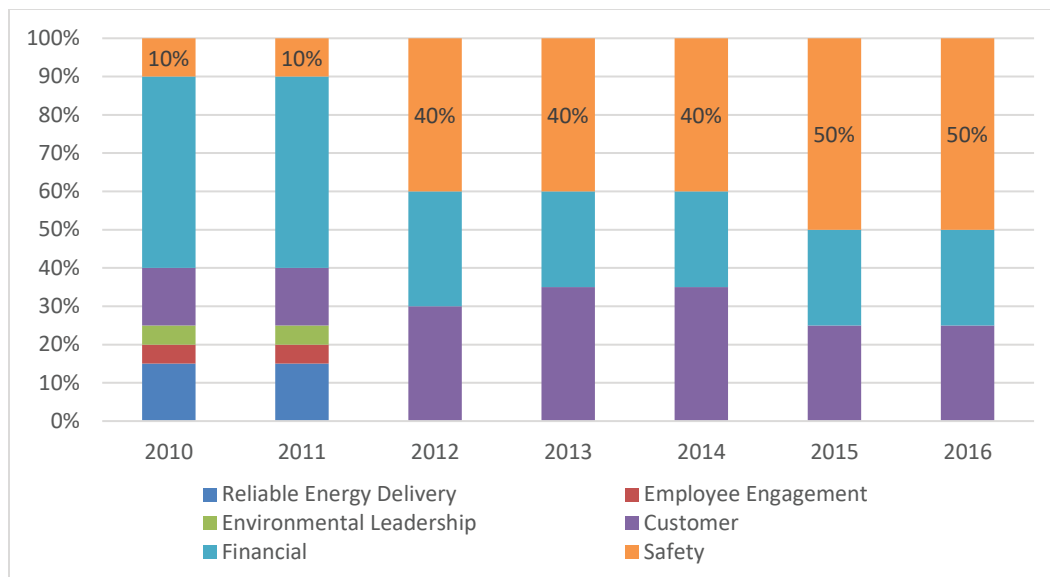
²⁰ This varies through the industry and it would be an element of the bargaining unit agreement.

²¹ This is one of the drivers behind OSHA's requirement that entities participating in VPP cannot provide incentives tied to OSHA reporting,

appropriate level. Previously, supervisors had OSHA recordables and MVIs as a goal. Now the Director-level is the lowest level at which these are a goal.²²

- For most employees, base pay is the largest component of their compensation. Annual increases are based on the employee's performance in terms of goal achievement and competencies and annual merit increase guidelines. Safety is included in the employee's goals and competencies.
- PG&E increased the weighting of safety measures in the STIP from 10 percent in 2011 to the current level of 50 percent as shown in **Exhibit VII-5**. The 50 percent weighting is considerably higher than typical of the utility industry.²³ It should be noted that over time, some of the metrics classified as "Customer", such as gas dig-in reduction and the in-line inspection index were moved into the "Safety" category.

Exhibit VII-5
STIP Metric Safety Weighting



Source: DR 004 Attachment 008, DR 006-CONFIDENTIAL (Compensation Committee Materials)

- As discussed in further detail in Conclusion 5, the amount of the STIP payout has been reduced as a result of safety incidents.

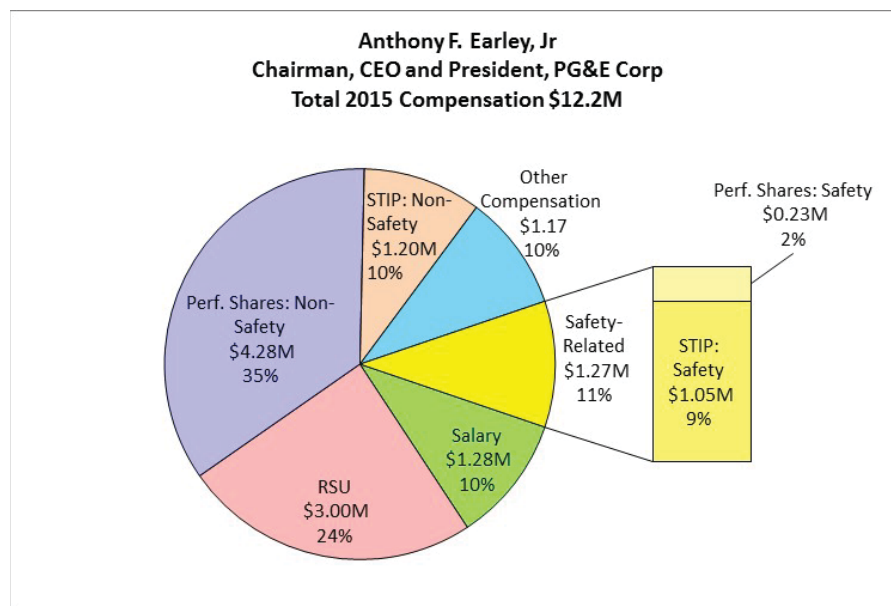
²² IR 238

²³ NorthStar's experience, Compensation Consultant research (IR 259)

4. For leaders that participate in the LTIP, the direct tie between safety performance and compensation is not as strong due to the relative levels of STIP and LTIP potential payout. The LTIP functions as intended for employees that remain with PG&E following a significant safety incident but does not function retroactively.

- The LTIP represents a significant portion of executive management's annual compensation award. The LTIP is deferred compensation subject to payment requirements.
- The LTIP is composed of performance shares and RSUs. Previously the split was 50 percent each. In 2015, an employee safety metric, Lost Work Day (LWD) Case Rate, was added to the LTIP and used to determine 5 percent of the value of performance shares. An affordability metric was also added representing 5 percent of the value of the performance shares. This increased the weighting on performance shares to 60 percent. Performance shares account for 60 percent of the LTIP from 2015 through 2017. For 2017, the LTIP safety metric was changed from LWD Case Rate to SIF – Effectiveness of Corrective Actions.
- **Exhibit VII-6** provides a breakdown of the compensation awarded to Mr. Earley in 2015. If the LTIP were to pay out based on the values at time of award, the safety-related compensation would account for roughly 11 percent of his total annual compensation (The value of the LTIP shown assumes that PG&E achieves its LTIP targets.) The same is true for the other Named Executive Officers (NEOs).
- The STIP target is 100 percent of salary for the CEO.
- In 2015, the LTIP award was over 5 times salary - \$7.5M. The safety component of that was \$0.23M, not enough to serve as a significant incentive.

Exhibit VII-6 2105 Awarded Compensation – CEO



Source: 2016 Joint Proxy Statement

- Although safety is not a large component of the LTIP, PG&E's safety performance and the incident at San Bruno have affected the LTIP. The payout in February 2011, for performance shares for the three-year period ending December 2010 was 100 percent. In 2012, 2013 and 2014 there was no payout for the performance shares granted three years prior, as PG&E's TSR was at the bottom of the comparator group. In 2015 the payout was 35 percent and for 2016 it was 50 percent.²⁴
 - Similarly, the RSU are tied to stock price. PG&E's stock price was also below the comparator group during this period.
- 5. There are processes by which the Board of Directors and executive leadership may hold themselves and management accountable for decisions and actions which may impact safety or PG&E's safety culture. This is primarily through the STIP. For the most part, the financial markets must hold them accountable under the LTIP.**
- PG&E management generally informs the NOS Committee and the Boards of employee and contractor fatalities.²⁵ With the introduction of the SIF Prevention Program, the NOS Committee receives updates on SIF exposure percentage, SIF exposure counts, timely corrective actions completed, and SIF counts (contractor,

²⁴ DR 565 Attachment 001 (2017 GRC Late Filed Exhibit on Executive Compensation and Safety, Exhibit (PG&E-43)), DR 006-CONFIDENTIAL, Compensation Committee Meeting Minutes.

²⁵ DR 767, DR 006-CONFIDENTIAL (Review of Board Meeting Minutes), IR 240 (Attendance at NOS Committee Meeting – recent vegetation management contractor fatality was discussed)

public and employee), along with other safety metrics. Beginning in 2012, PG&E provided routine safety reports to the NOS Committee.²⁶

- At its December 2010 meeting, the Compensation Committee modified the STIP structure such that a work-related employee fatality would not automatically reduce the safety rating as the Compensation Committee has the discretion to modify the rating.²⁷
- The Board has discretion to adjust the amount of the STIP payments Officers.
 - In February 2011, the Compensation Committee exercised its discretion and eliminated the 2010 STIP payments to Officers. At that time the Committee did not have the discretion to the STIP rating for non-officer and management had not communicated any such discretion to non-officer employees.²⁸ However, the Safety Index Score had been capped at 1.0 due to two on-the job fatalities, in accordance with the calculation methodology.²⁹
 - For 2011 and beyond, the STIP Plan documents and PG&E communications were to clearly communicate the Committee's discretion to reduce STIP payments and ratings to all employees.³⁰
 - In February 2016, the Compensation Committee reduced the final LWD Case Rate Score to zero in light of a September 30, 2015 employee fatality. A serious injury has an impact on LWD, but a fatality does not. This was the first year that LWD would have resulted in a bonus.³¹
- Conversely, San Bruno expenses were removed from the 2010 and 2011 Earnings from Operations (EFO), as they were considered an Item Impacting Comparability.³² Unbudgeted items related to natural gas pipeline matters were similarly removed from the 2012 STIP performance results.³³ This served to increase the payout associated with the financial component of the STIP.
- In 2015, PG&E added a safety component to the LTIP; however, this accounts for only 5 percent of the LTIP award.

6. Current BPR and STIP/LTIP metrics do not address all aspects of safety.

- The events leading up to the OII included two incidents at the Kern Power Plant involving contractor fatality and a contractor serious injury, a house explosion in Carmel, two separate attacks on the West Park Substation in Bakersfield, a security breach at the Metcalf substation and violations related to the natural gas pipeline

²⁶ DR 006-CONFIDENTIAL, NOS Committee Meeting Minutes

²⁷ DR 006-CONFIDENTIAL, December 14, 2010 Compensation Committee Meeting Minutes

²⁸ DR 006-CONFIDENTIAL, February 15, 2011 Compensation Committee meeting package

²⁹ DR 565 Attachment 001 (2017 GRC Late Filed Exhibit on Executive Compensation and Safety, Exhibit (PG&E-43))

³⁰ DR 006-CONFIDENTIAL, February 15, 2011 Compensation Committee meeting package

³¹ DR 006-CONFIDENTIAL, February 16, 2016 Compensation Committee Meeting Minutes

³² DR 006-CONFIDENTIAL, February 15, 2011 February 14, 2012 Compensation Committee meeting package

³³ DR 006-CONFIDENTIAL, February 20, 2013 Compensation Committee meeting package

system. PG&E has also experienced employee and contractor fatalities since the start of NorthStar's review. Other than LWD Case Rate, the STIP metrics do not address these issues.

- There are no metrics related to facility security.
 - Contractor safety is included in the BPR metrics but not the STIP.
 - Power Generation tracks public safety awareness as part of the BPR process but Electric T&D and Gas Operations do not.
 - There are no enterprise-level environmental safety or cyber security metrics.
 - The gas leak emergency response metric ties to actions intended to prevent or minimize damages and injuries; however, this requires the customer to call in when they smell gas.
- 7. There has been ongoing change in some of the STIP and LTIP measures. While this is partially indicative of the current state of PG&E's safety culture evolution, it makes performance trending more challenging. Additionally, newly introduced metrics are more subjective than prior metrics.**
- **Exhibit VII-7** shows the evolution of STIP and metrics from 2014-2017. Shading is used to highlight changes.

Exhibit VII-7
STIP and LTIP Metrics – 2014 to 2017

	2014	2015	2016	2017
STIP				
Safety				
Public Safety				
DCPP Unit 1 Safety and Reliability Index	4%	4%	4%	4%
DCPP Unit 2 Safety and Reliability Index	4%	4%	4%	4%
Electric Overhead Conductor Index				5%
ET&D Wires Down (Instances less major events)	4%	5%	5%	
ET&D 911 Response within 60 minutes	4%	5%	5%	5%
Gas In-Line Inspections and Upgrades (complete planned work)		6%		
Gas Dig In Reduction	4%	5%	5%	5%
Gas Emergency Response	4%	5%	5%	5%
Employee Safety				
SIF Corrective Action Index (Quality and Timely Completion)				6%
Timely Reporting of Injuries			4%	4%
LWD Case Rate	8%	8%	6%	
SPMVI	8%	8%	6%	6%
Subtotal	40%	50%	50%	50%
Customer				
Gas In-Line Inspections and Upgrades (complete planned work)	5%			
Execute Gas Pipeline Safety Work Index	5%			

	2014	2015	2016	2017
STIP				
Safety				
Gas Asset Mapping Duration	5%			
Customer Satisfaction (products and services)	10%	15%	15%	15%
SAIDI	10%	10%	10%	10%
Subtotal	35%	25%	25%	25%
Financial				
Earnings from Operations	25%	25%	25%	25%
Subtotal	25%	25%	25%	25%
TOTAL	100%	100%	100%	100%
LTIP				
Performance Shares				
TSR		50%		50%
SIF Effectiveness of Corrective Actions				5%
LWD Case Rate		5%	5%	
Affordability/Financial EFO per Share				5%
Affordability (Three Year Efficiency Gains)		5%	5%	
		60%	10%	60%
RSUs (Tied to Stock Price)		40%	40%	40%

- Most of the 2016 metrics were still lagging indicators. PG&E has been striving to increase the number of leading indicators in the STIP and LTIP.
- Until recently, PG&E's philosophy was to use metrics that were auditable, with an emphasis on benchmarking.
- For 2017, PG&E made changes to its STIP metrics as described below. According to PG&E this increased the number of leading indicators, but in actuality it also reduced the number of KPIs that could be benchmarked and increased the subjectivity of some of the metrics. It is too early to determine the effectiveness of these metrics.³⁴
 - After gaining some traction in its efforts to drive the industry towards the reporting of a T&D Wires Down metric, PG&E eliminated the metric from the STIP. According to PG&E, this was because California' drought had made benchmarking and target setting problematic. PG&E replaced T&D Wires Down with an Electric Overhead Conductor Index. The Electric Overhead Conductor Index includes three equally weighted metrics: 1) electric distribution infrared inspections; 2) electric distribution conductor upgrades and 3) T&D vegetation management Public Safety and Reliability Program (PS&R). This metric cannot be benchmarked.
 - PG&E eliminated the LWD metric due to OSHA requirements, and replaced it with a SIF Corrective Action Index. The SIF Corrective Action Index is based on two equally weighted measures: 1) Quality of corrective actions and 2) Timely completion of corrective actions. The quality of corrective actions is to be determined by a third party, to minimize subjectivity. Effectiveness of corrective actions is not part of the index.
 - Revised the DCCP Reliability and Safety Indicator to reflect industry 2020 goals.

³⁴ DR 006-CONFIDENTIAL, December 15, 2016 Compensation Committee Materials.

- Revised the Customer Satisfaction Score weighting to 60 percent residential/40 percent small and medium business.
- In 2017, PG&E changed the safety component of the LTIP from LWD to the effectiveness of SIF corrective actions.³⁵

8. PG&E makes extensive use of benchmarking and targeted reviews to evaluate its performance and practices, identify opportunities for improvement and implement change.³⁶

- Between 2010 and 2016, PG&E performed numerous benchmarking and best practices reviews. The studies were used to evaluate PG&E's performance and practices against industry peers and identify perceived weaknesses and areas for improvement:
 - In 2015, PG&E participated in a third-party utility Safety Benchmarking Survey.³⁷ The survey provided detailed information on employee safety performance; safety organization structure, reporting relationships, and staffing ratios; non-labor safety spending; safety communications and training; rewards and recognition programs; safety observation programs; injury and safety incident management; and, safety reporting.
 - PG&E is a member of the AGA and EEI, thus providing it with access to safety statistics and comparative data. Comparisons include PMVI rates, LWD and other OSHA reporting.
 - PG&E benchmarks many of its STIP and other metrics against other utilities. Targets are frequently in the form of quartiles or deciles.³⁸
- In addition to performing or participating in broad, data-based benchmarking, PG&E has conducted focused reviews of known or perceived leaders in corporate safety culture. Examples include.
 - In February 2012, PG&E Gas Operations met with Alaska Airlines to learn from the airline's turnaround after its 2000 crash. Topics covered included: Alaska Airline's daily operations call; the control room; contractor oversight and reporting; process compliance; data and metrics; governance, employee relations and other cultural takeaways.³⁹ The daily operations call was implemented in both gas and electric.
 - Prior to designing the new gas control center, PG&E met with Enbridge, Atmos and Northwest Natural.⁴⁰
 - In 2013, PG&E evaluated the Corrective Action Programs used by DCP (internal), Boeing and Idaho National Lab.⁴¹

³⁵ DR 006-CONFIDENTIAL, December 15, 2016 Compensation Committee Materials.

³⁶ The list is not intended to be comprehensive.

³⁷ DR 147 Attachment 001 - CONFIDENTIAL

³⁸ BPR Books

³⁹ DR 182 and DR 182 Attachment 001-CONFIDENTIAL

⁴⁰ DR 182, DR 182 Attachment 002

- Prior to implementing its contractor safety program, PG&E reviewed the practices of ABB, Black & Veatch, Dashiell, ARB, GE and Quanta. Areas evaluated included: how contractor safety is measured and monitored, feedback mechanisms and the identification of utilities that the entities felt have good safety programs.⁴²
- PG&E and its employees are involved in a variety of trade associations and participate in industry conferences that allow it to exchange ideas and benchmark practices. These include: Interstate Natural Gas Association of America (INGAA), AGA, NACE International (formerly known as the National Association of Corrosion Engineers, API, American Society of Mechanical Engineers (ASME), Southern Gas Association (SGA), Western Energy Institute, Common Ground Alliance, Western Regional Gas, International Pipeline Conference and World Gas Conferences.⁴³

9. PG&E does not adequately share internal best practices.

- Most cross-functional committees are at a high level and do not promote feedback from the rank and file to solve problems or identify potential solutions.
 - LOB committees and counsels include representation from field employees but these are frequently the same designated representatives, and the same individuals consistently appear on committees and task forces.
 - Broader representation across the workforce in various task forces and committees would promote a better exchange of ideas and allow individuals with more direct involvement to brief colleagues rather than the hierarchical “down briefing” that currently occurs.
- Recent analyses regarding LWDs indicate that some incidents could have been avoided with lessons learned sharing across the LOBs.⁴⁴
- During the course of the review, NorthStar identified several process differences and shared this information with the LOBs.

D. RECOMMENDATIONS

Recommendations for PG&E

1. None of the KPIs currently considered for use in measuring safety culture should be included as an incentive measure (i.e., included as part of the STIP or LTIP). This will only serve to provide artificially inflated results or drive unintended consequences. Most of the proposed metrics are based on either employee surveys or near hit/CAP reporting. Incentives tied to employee submittals will ensure targets are met and may minimize the value of the submittals (for example, a sudden influx of not particularly meaningful

⁴¹ DR 004 Attachment 001

⁴² DR 049 Attachment 001

⁴³ DR 182

⁴⁴ DR 831

submittals prior to the end of a reporting period). Similarly, an incentive tied to survey results will drive positive reporting rather than true results.

2. Continue to track metrics eliminated from STIP as part of the BPR process to allow trending.
3. Increase the weighting of safety in the LTIP to more closely align safety performance and executive compensation.
4. Reevaluate the appropriateness of the Earning from Operations component of the STIP due to its lack of transparency and the ongoing adjustments for Items Impacting Comparability.
5. Revisit all STIP metrics and targets in light of the enterprise-wide safety plan recommended by NorthStar. Set multi-year targets to drive performance. Include a contractor safety metric in the STIP. Following the development of the enterprise safety plan, PG&E should develop STIP and BPR metrics that measure plan implementation/adoption and the effectiveness of the various initiatives identified in the plan. PG&E should continue monitor and report lagging OSHA metrics (i.e., DART, LWD, MVIs, fatalities) as part of the BPR process.
6. Develop a more robust and comprehensive set of BPR metrics addressing all aspects of safety such as public, employee and contractor safety; facility, infrastructure/asset and cyber security; environmental safety; public awareness; and, safety culture.
7. Improve the internal sharing of best practices. Increase the level of involvement by different groups and employee levels. As an example, NorthStar performed a management audit of National Grid Gas' NY operations a few years ago for the New York Public Service Commission. The utility had a fairly robust process improvement program. NorthStar's report describing the process is available on the New York State Department of Public Service's website.

Recommendations for the Commission

1. Assess the effectiveness of the newly introduced 2017 STIP and LTIP metrics.
2. Eliminate penalties for self-reporting of safety-related incidents by the California utilities; instead, implement a system that encourages reporting of actual and potential safety incidents to be shared among the utilities in order to identify best practices and share lessons learned. Actual incidents should be reported, as well as near hits. The CPUC should work with the California IOUs to define the parameters of near hit reporting. The system should be open to municipalities to encourage lessons learned sharing across the state.
3. Working with all California IOUs, develop a listing and consistent definitions of key safety-related metrics and other information to be tracked on a monthly basis and reported to the CPUC at an agreed upon frequency. Performance reporting should be handled in a non-punitive manner, but subject to audit by the CPUC. On an annual basis,

each utility's Internal Audit function should audit and render an opinion as to the accuracy of the information reported to the CPUC.

4. Consider the implementation of a performance-based ratemaking mechanism with a fixed component based on traditional ratemaking principles and a variable adder based on safety performance. Both components should have defined ranges. Safety performance can be defined in a variety of ways. As with any incentive mechanism, the potential for gaming is real. NorthStar's recommendations to PG&E, includes items that should provide a greater tie between safety performance and executive compensation.
 - NorthStar has recommended that PG&E reevaluate the appropriateness of the Earnings from Operations component of the STIP due to its lack of transparency and the ongoing adjustments for Items Impacting Comparability.
 - NorthStar recommends that PG&E increase the weighting of safety in the LTIP to more closely align safety performance and executive compensation. For a Named Executive Officer, the amount of compensation tied to safety performance through the STIP and LTIP is roughly eleven percent of the amount of total compensation awarded in a given year assuming stock prices remain at the assumed level and the Total Shareholder Return over the next three years is at target.
 - Increasing the proportion of LTIP meaningfully tied to safety-performance over a three-year horizon, may increase the tie between safety and compensation at the executive level. The design of this or a clawback mechanism would need to be carefully constructed to provide a reasonable likelihood of achieving the goal.
 - Consideration could also then be given to providing the Compensation Committee with similar authority over the granting of the safety portion of the LTIP – similar to the discretion it has over the STIP.

CHAPTER VIII: RECRUITING AND TRAINING

Hiring the right people and providing proper training contributes to a company's safety performance. This chapter examines PG&E's recruiting practices that relate to hiring personnel who contribute to a positive safety culture. It also examines PG&E's training post-San Bruno, the safety culture training provided to leadership and the training of its LOB field personnel to help improve safety performance.

A. BACKGROUND

Recruiting and Hiring

Hiring the "right" employees helps foster a robust safety culture. Most safety training focuses on knowledge needed to conduct job activities safely, but may not always be effective in changing people's core behaviors and attitudes. As part of its hiring process for physical and clerical work, PG&E uses a behavioral assessment, the Work Orientations Inventory (WOI), to help predict an individual's safety performance. Some accidents may be difficult to avoid, but research shows that a large number of accidents and injuries are caused by people who behave carelessly, disregard safety rules and procedures, and take unnecessary risks.¹ If an organization can screen out some of these individuals during the hiring process, the overall number of accidents and injuries may be reduced, contributing to a positive safety culture.

Training

PG&E's classifies its training in three categories:

- **Enterprise** — Large, cross-cutting training performed at the Company level that impact multiple LOBs, such as Records Management or Information Security.
- **Safety and Compliance** — Safety and compliance training primarily driven by regulatory agencies, such as OSHA, EPA or NERC.
- **Technical** — Technical knowledge and skills training needed to perform work safely and reliably, such as leak survey or rubber glove use.²

Enterprise-wide training is approved by a Senior Leadership Training Committee. Compliance training is approved by a specified individual in each LOB, and Technical training for Electric T&D, and Gas Operations is approved by an LOB-specific training committee.³

PG&E develops a training profile for each employee that includes courses required to complete specific work, courses that meet company objectives, and leader-assigned or

¹ DR 032 Attachment 5-CONFIDENTIAL, p. 5

² DR 229 Attachment 2

³ DR 229 Attachment 1

discretionary training. Discretionary profiles may be used to improve the skills of employees, increase the workforce available to do specific work, or address a need identified by a supervisor.⁴ Each LOB has a Training Profile Lead responsible for maintain training profiles. Training profiles are maintained in PG&Es SAP system and accessed by employees through the My Learning application.

PG&E has a current initiative to identify training classes that are not included in My Learning and determine whether they should be tracked in My Learning by the end of 2016.⁵

The PG&E Academy, part of the Human Resources organization, develops and delivers technical and other training. The PG&E Academy works with the LOBs to identify training needs and develop classes. Key components and responsibilities of the PG&E Academy Production Process are shown in **Exhibit VIII-1**.

Exhibit VIII-1
PG&E Academy Production Process

Phase	PG&E Academy Responsibilities	LOB Responsibilities
Front-end Analysis (FEA)	<ul style="list-style-type: none"> Schedules FEA meeting Analyzes business needs and performance gaps 	<ul style="list-style-type: none"> Identifies stakeholders and audience; operator qualifications; safety risks and benefits; related training and prerequisites Provides skills and performance metrics; business metrics; requested timeline and funding
Kickoff meeting	<ul style="list-style-type: none"> Schedules and conducts meeting Introduces curriculum development team to LOB Discussing training opportunity Reviews project scope, timing and process Defines roles and responsibilities Begins task analysis 	<ul style="list-style-type: none"> Confirms scope, timeline and commitments Identifies SMEs and other resources for curriculum development
Task analysis	<ul style="list-style-type: none"> Links task analysis to learning objectives Links objectives to content Determines training solution and assessment strategy 	<ul style="list-style-type: none"> Describes the work activities and tasks to be covered in training: steps, tools, common errors, working environment, task difficulty
Learning Solution Proposal (LSP)	<ul style="list-style-type: none"> Document the following: training solution; project scope, budget and timeline; resources needed; risks, issues; roles and responsibilities Uploads for LOB approval 	<ul style="list-style-type: none"> Reviews and approves LSP
Courseware and assessment development	<ul style="list-style-type: none"> Develops courseware and assessments Schedules and conducts review meeting 	<ul style="list-style-type: none"> Meets regularly with the curriculum development team and provides content and resources Provides SMEs and detailed feedback and approves revisions and costs

⁴ DR 604

⁵ DR 292

Phase	PG&E Academy Responsibilities	LOB Responsibilities
Train-the-trainer	<ul style="list-style-type: none"> Train instructor on delivery techniques, logistics, messaging 	<ul style="list-style-type: none"> Provides training resources Provides pilot participants
Pilot	<ul style="list-style-type: none"> Delivers course in controlled environment Updates courseware and assessment as necessary Posts final deliverable 	<ul style="list-style-type: none"> Delivers course in controlled environment (if LOB-owned) Approves final deliverables
Delivery	<ul style="list-style-type: none"> Opens enrollment and begins training 	<ul style="list-style-type: none"> Opens enrollment and begins training (if LOB-owned)
-Lessons learned	<ul style="list-style-type: none"> Reviews the project to identify improvements, successes, evaluations and sustainability plans 	<ul style="list-style-type: none"> Provides stakeholders and input

Source: DR 351 Attachment 2.

PG&E uses the ADDIE model framework (Analyze, Design, Develop, Implement, Evaluate) for the development of training curriculum. The widely-used ADDIE model provides guidelines in five phases:

- Analyze – A systematic exploration of the way things are, and the way things should be. The difference is the performance gap.
- Design – Outline the performance objectives.
- Develop – Create the performance solution using information gathered in the analysis and design phase.
- Implement – Delivery of the performance solution.
- Evaluate – Measurement of how well the performance solution achieved the objectives.⁶

Gas Operations Training

PG&E has well-defined career paths for its gas operations field personnel with prescribed training, and skills and knowledge requirements.

Exhibit VIII-2 provides an overview of general lines of progression for field positions. Promotions to higher positions are based on specified curricula, periodic in-class instruction, progress testing, on-the-job field training, and testing for the relevant operator qualifications.⁷ As shown in Exhibit VIII-2, Gas system field and operations employees typically start as Utility Workers. Utility Worker training consists of either ten or fifteen days of classroom and field training. The ten-day program is for technicians; candidates for construction positions require an additional five days of training. This training is provided at a dedicated facility at PG&E's Tracy Service Center.

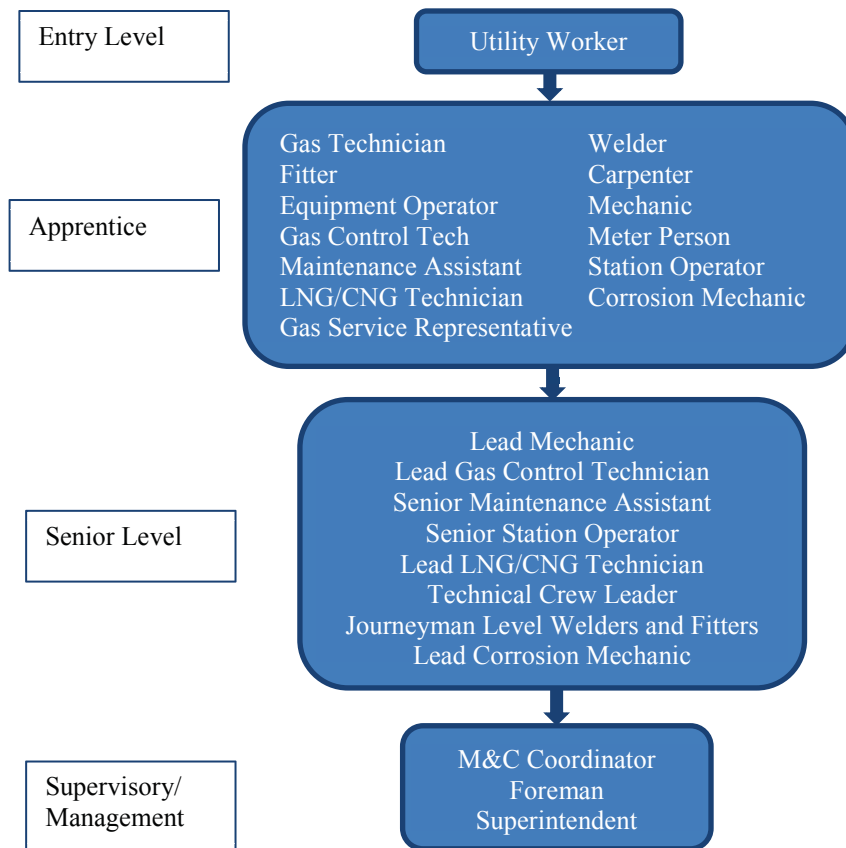
After successful completion of the Utility Worker Program, students bid on open positions and begin a formal path for professional progression in one of the apprentice programs to become a journeyman or technical lead.⁸

⁶ DR 391 Attachment 1

⁷ DR 420 and 486; IRs 105 and 174

⁸ DR 420 and 486, IRs 105 and 174

Exhibit VIII-2 Typical Gas O&M Field Positions



Source: DR 420.

Positions beyond Utility Worker receive both classroom instruction and on-the-job field training, managed by PG&E's Learning Academy and developed by PG&E subject matter experts. Each position has a curriculum map that provides details regarding training, including material to be covered on each day, skills development, and testing.⁹

An overview of Gas Operations training programs in 2015/2016 is shown in **Exhibit VIII-3**. In 2015, 38 percent of Gas Operations training was delivered in the field.¹⁰

⁹ DR 420 and 486, IR 105 and 174

¹⁰ DR 391 Attachment 1

Exhibit VIII-3 Overview of Gas Operations Training Programs

Location	Programs
Livermore	<ul style="list-style-type: none"> ▪ Locate & Mark ▪ Leak Survey ▪ Corrosion Training ▪ Vehicle & Equipment Training
Tracy	<ul style="list-style-type: none"> ▪ Utility Worker ▪ Plastic Systems
San Ramon	<ul style="list-style-type: none"> ▪ Field Service ▪ Welding ▪ Gas Pipeline Operations & Maintenance ▪ Engineering & Operations
Field Locations	<ul style="list-style-type: none"> ▪ Pipe Squeezing ▪ Lock Out/Tag Out ▪ Hazardous Gaseous Atmosphere Training

Source: DR 391 Attachment 1.

In early 2017, PG&E plans to move most of its gas-related training to a new facility in Winters.¹¹

Most Gas Operations personnel that work on gas transmission and distribution lines possess operator qualifications (OQ) to perform specific tasks. Natural gas transportation is regulated at the federal level by the Pipeline and Hazardous Materials Safety Administration of the US Department of Transportation. Title 49, Subtitle B, Part 192 of the Code of Federal Regulations (CFR) provides the minimum federal safety standards for transportation of natural gas and other gas by pipeline. Subparts E, F and N of CFR 49 Part 192, stipulates the requirements of pipeline personnel and the minimum requirements for operator qualification of individuals performing covered tasks on a pipeline facility. Covered tasks are addressed in utility-specific work procedures that cover over 150 distinct activities, including welding of specific diameter pipes, repairing pressure relief valves, electrofusion of saddle joints, corrosion inspection of residential services, and excavation work. A valid OQ permits an employee to work a task independently on PG&E's system. Employees that do not possess valid OQs may work on PG&E's system but must be directed and supervised by an individual possessing a valid OQ.

Electric T&D and Power Generation Training

The PG&E Academy and the LOBs plan and deliver Electric T&D and Power Generation training.¹² Four two-person Training teams deliver electrical technical training at eleven local sites:

<ul style="list-style-type: none"> • Bakersfield • Chico • Davis 	<ul style="list-style-type: none"> • Fortuna • Fremont • Edenvale 	<ul style="list-style-type: none"> • Livermore • Oakport 	<ul style="list-style-type: none"> • Petaluma • Santa Maria • Stockton.
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¹¹ 2017 General Rate Case Prepared Testimony Exhibit PG&E-8 – Human Resources

¹² DR 601

The Electric Operations Apprentice Delivery Team is responsible for the Pre-Apprentice Lineman, Apprentice Lineman, Apprentice Cable Splicer and Apprentice Helicopter Training programs, primarily at the Livermore Training Center.

PG&E's Electric Pre-Apprentices and Apprentice program was substantially modified in 2011. The current Electric T&D Apprenticeship at PG&E is a five-year program. Successful candidates start out as Pre-Apprentice Linemen (PAL) for one year. When they meet all of the PAL requirements during that year, they move to first step Apprentice Linemen (AL). Once they reach this level, they continue to progress every six months for four years, ultimately completing eight steps as an Apprentice Lineman.¹³

Each AL step contains specific formal training, on-the-job experience requirements, and skill assessments.¹⁴ At the end of each step, the Training Academy conducts a Step Progression Test, held at the Livermore Training Center to determine if a Pre-Apprentice or Apprentice possesses the knowledge and skill required to progress to the next step. The Step Progression Tests consist of a written exam and skill assessment and also serve as wage progression tests in Years 2 through 4. The Step Progression Tests are cumulative, i.e., the test for Step 4 also includes tasks covered in Steps 1 through 3.¹⁵

Exhibit VIII-4 shows the number of pre-apprentices and apprentices completing the respective programs, from 2011 through 2016 year to date.

Exhibit VIII-4
Number of Pre-Apprentice and Apprentice Electric Linemen

	Pre-Apprentice Program			Apprentice Program		
	Began	Completed	Remain	Began	Completed	Remain
2011	236	156	0	156	64	66
2012	60	49	0	49	0	47
2013	60	44	0	44	0	42
2014	100	71	0	71	0	67
2015	59	31	15	31	0	31
2016	41	0	41	0	0	0
Overall	556	351	56	351	64	253

Source: DR 392.

Power Generation currently has five apprenticeship programs:

- Apprentice Water System Repairperson T200
- Apprentice Water System Repairperson T300

¹³ DR 473

¹⁴ DR 473 Attachment 1

¹⁵ DR 473 Attachment 1

- Apprentice Hydro Operator in Training
- Apprentice Electrical Machinist (Hydro)
- Apprentice Electrician.

Unlike the electric apprenticeship program, there are no specific step progression tests for the Power Generation apprenticeship programs. There are some wage progression tests (e.g., Hydro Operator in Training Step 1) and to the extent that a wage progress lines up with the steps, passing the wage progression test is a requirement. However, to the extent that a specific step requires completion of one or more courses, the apprentice is required to pass the assessments associated with the specific course in order to complete the step.¹⁶

As shown in **Exhibit VIII-5**, there are less than 20 Power Gen Apprentice graduates each year from 2016 through 2019. The number of Power Generation apprentices is based on the forecast need for journeymen in the relevant classifications.

Exhibit VIII-5
Projected Generation Apprentice Programs Graduates by Year

	Apprentice Electrician (EL&H)	Apprentice Electrical Machinist (Hydro)	Apprentice Hydro Operator in Training (HOIT)	Apprentice Water System Repairperson	Apprentice Water System Repairperson GC	Total
2016	3	1	7	2	0	13
2017	0	1	1	3	2	7
2018	4	1	2	4	5	16
2019	3	4	0	0	8	15

Source: DR 682.

Safety Leadership Training

A summary of PG&E's core safety leadership culture classes is shown in **Exhibit VIII-6**. The classes are discussed in more detail following the Exhibit.

¹⁶ DR 682

Exhibit VIII-6
Core Safety Culture Classes

Training Program	Development and Delivery Owner	Description	Target Audience	Completion Status as of Dec. 2016	2012	2013	2014	2015	2016
Safety Leadership Workshop (post-San Bruno)	SH&E	These workshops took place following the San Bruno incident (2012 to 2014) to ensure all leaders understood the safety direction PG&E was taking and the new expectations of leaders	All leadership: • Officers • Directors • Managers • Supervisors • Crew Foremen	100%	X Start	X	X End		
Safety Leadership Development program	SH&E	In collaboration with an outside consultant, PG&E developed more comprehensive safety leadership training	All operational • Supervisors • Superintendents • Managers	By end of 2016, 95% of targeted leaders will have completed the program. Others will take Leading Forward Program 2			X Start	X	X End
Safety 360-Degree Assessments and In-field Coaching	SH&E	360-degree assessments provide feedback from individual's manager, peers, and direct reports. In-field safety coaching on the job	All operational: • Supervisors • Superintendents • Managers	83% of the first 360-degree assessments and 78% of the first in-field completed			X Start	X	X Continue in 2017
Leading Forward Program 2: Safety Leadership	Human Resources' Leadership and Employee Development (HR LED)	Leading Forward is PG&E's current leadership development with of 6 separate programs.	The following positions with field employees in high hazard operations: • Supervisors • Crew Foreman • Superintendents • Managers Superintendents and Managers will facilitate the sessions with HR LED instructors. Vice Presidents and Directors will participate as "engagement leaders" and receive a targeted version of the training first.	Developed in 2016. Initial delivery in Q1-Q2 2017					X Develop
Annual Officer and Director Safety Summit	Corporate Comms.	All-day annual meeting attended by PG&E Officers and Directors with a focus on safety	All Officers and Directors	Annual Meeting				X	X

Source: DR 575 Attachment 1.

VIII-8

RECRUITING AND TRAINING



Safety Leadership Workshops

After San Bruno, PG&E implemented and designed a safety stand-down in order to ask every single leader to “pause” and focus on safety leadership. The stand-down consisted of a full day workshop, known as the safety leadership workshop (SLW). The SLWs took place between 2012 and 2014. All Crew Foreman, Supervisors, Managers, Directors and Executives completed these workshops.¹⁷

Safety Leadership Development Program

In 2013, PG&E began to develop more comprehensive safety leadership training in collaboration with an external consultant. The six culture workshops are also referred to as the Safety Leadership Development (SLD) program. The workshops are intended to provide PG&E leadership with practical information and guidance to increase their competence and confidence to be an effective safety leader. The six courses are listed below:

1. Foundations
2. Safety Connections
3. Job Safety Briefing
4. Physical Hazard Inspection
5. Life Saving Rules
6. Understanding and Influencing Behavior.¹⁸

PG&E began delivery of the six workshops in 2014 and plans to discontinue delivery of these workshops at the end of 2016.¹⁹

Safety 360 Assessments and In-field Coaching

The SLD program includes 360-degree surveys to obtain feedback from an individual and the individual’s manager, peers, and direct reports on safety leadership performance, as well as in-field coaching to address issues identified in the assessment. While the SLD program ended in 2016, these activities will continue in 2017.

Leading Forward Program 2: Safety Leadership

In 2015, PG&E began to replace its leadership development programs with a series of courses under the “Leading Forward” umbrella. Employees in leadership roles from crew leaders to Directors will attend the Leading Forward programs to build their leadership effectiveness through a practical approach comprised of self-assessment, on the job experience, education, coaching and feedback.²⁰ The eight courses in the Leading Forward Program and their precedents are shown in **Exhibit VIII-7**.

¹⁷ DR 314 Attachment 1 # 10

¹⁸ DR 460

¹⁹ DR 460

²⁰ DR 290 Attachment 51

Exhibit VIII-7 Leading Forward Programs

Leading Forward			Predecessor	
Program	Target Audience	Pilot Date	Program	Pilot Date
1. Preparing for Leadership	Emerging Leaders	2017 Q3	Considering Supervision	2013 Q2
2. Safety Leadership	Crew Leaders	2017 Q2	Crew Leadership Program	2014 Q2
3. New to Leadership at PG&E	Newly Hired or Promoted Leaders	2015 Q2	New Leader Orientation	2014 Q1
4. Advanced Team Leadership	Supervisors	2016 Q4	Supervisor Leadership Program	2011 Q1
5. Expanding your Influence	Managers/ Superintendents	2017 Q1	Manager Leadership Program	2012 Q3
6. Strategically Leading at PG&E	Directors	2015 Q3	-	-
7. Leading One PG&E	High Potential Directors and Senior Directors	2015 Q1	High Potential Director Program	2012 Q3
8. Executive Leadership	Officers	2016 Q1	-	2011 Q3

Source: DR 32 Attachments 8 and 9; DR 290 Attachment 51; DR 577.

Beginning in 2017, Leading Forward Course 2: Safety Leadership will be the safety leadership training for crew leaders and supervisors in the Electric T&D, Gas Operations, Generation, IT, Customer Care, and S&SS LOBs. New leaders and those did not complete the pre-2017 SLD Program (six workshops) will also complete the Leading Forward Safety Leadership class.²¹

Annual Officer and Director Safety Summit

In 2015 and 2016, PG&E's Corporate Communications organization coordinated annual one-day Safety Summits for Officers and Directors.

Measuring Training Effectiveness

PG&E uses the Kirkpatrick Training Evaluation Mode as its primary method to evaluate the effectiveness of its training. The Kirkpatrick Model is widely-used, and assesses the value of training across five levels:

- Level 1: Student Satisfaction – Participant survey
- Level 2: Knowledge and Skill Transfer – Pass skills and knowledge assessments
- Level 3: On-the- Job Application – Work done correctly on the job
- Level 4: Business Impact – Increased production/Improved safety results
- Level 5: Return on Investment – Financial benefits related to training.²²

²¹ DR 460

²² DR 4 Supplement 1 Attachment 10

PG&E generally performs Level 1 and/or Level 2 assessments of its training classes.²³

B. EVALUATIVE CRITERIA

- Is behavior-based testing for workforce recruiting effectively used to improve the ability to hire personnel who have an understanding of a good safety culture and, over time, to improve the safety results within the company?
- Does the type of training provided, and the amount of training, have a positive impact on the safety culture of PG&E?
- Does PG&E measure and report the effectiveness of its safety training?
- Does the ongoing coaching of executives lead to a measurable improvement in the overall safety culture within the company?
- Are leaders prepared and effective in leading cultural change?

C. FINDINGS AND CONCLUSIONS

1. PG&E's use of the WOI, recruiting strategies and interview process for new hires contributes to a positive safety culture.

- PG&E uses the WOI to assess applicants for both clerical and physical positions.²⁴ PG&E contracted with an outside vendor to select and validate an applicant testing process in February 2010.²⁵ The WOI is an off-the shelf test used to assist in hiring employees who are more likely to be safe, careful, and productive and less likely to have accidents and injuries or make careless, on-the-job mistakes.
 - In addition to its implementation at PG&E, the test has undergone numerous validation studies and has been administered to over 300,000 employees and applicants.
 - The results indicate that the WOI is related to a variety of important performance dimensions, including: working safely; stress tolerance; reliability and dependability; following rules and instructions; teamwork; interpersonal effectiveness; accidents on the job; and vehicular accidents.²⁶
- PG&E uses a Recruiting Strategy Guide to help determine how to best recruit candidates. The Recruiting Strategy Guide includes a section called "success profile" in which the hiring manager lists key competencies and behaviors of successful employees, including the question, "What does safety and compliance mean in this role?"²⁷

²³ DR 22

²⁴ DR 32 Attachment 2

²⁵ DR 32 Attachments 3-CONFIDENTIAL and 4-CONFIDENTIAL

²⁶ DR 32 Attachment 2

²⁷ DR 299 Attachment 3

- The Job Interview Guides for Superintendent, Manager and Supervisor positions in T&D functions include a variety of questions that are designed to ascertain the candidate's safety skills and ability to succeed in a changing environment, including:
 - What does safety mean in your current role? How has it prepared you to lead a safe team in the new role?
 - Describe a time you do to provide coaching/feedback to an underperforming/challenging employee regarding issues in his or her performance.²⁸

2. The Safety Leadership Workshops conducted in 2012 to 2014 contributed to the development of an improved safety culture at PG&E.

- PG&E developed the SLW to establish a common understanding of where PG&E had been, what it had learned, and where it was headed in regard to safety culture.²⁹ The SLW set the stage for substantial changes in safety management and safety culture within the company. It also set expectations for leaders to improve their skills and provide safety leadership.³⁰
- These all-day workshops were designed by PG&E and conducted primarily in 2012 and 2013.³¹ Topics discussed include:
 - Lesson 1: PG&E's Story – Discussions of the San Bruno accident, associated findings, safety trends, and actions taken to improve safety culture.
 - Lesson 2: Alaska Airlines – Overview of Alaska Airlines Flight 880 accident, recovery strategy (safety, safety, safety), and how this applies to PG&E (need to strengthen our safety culture).
 - Lesson 3: Lesson Learned – An assessment of past practices that may have encouraged under-reporting, including examples of instances of managers not listening to employees who reported system issues.
 - Lesson 4: Your Role as Leader – Safety-related discipline and recognition is behavior-based, not incident or results-based.
 - Lesson 5: Taking a Stand – What each individual can do to improve the safety climate.³²
- Vice Presidents and Directors from all LOBs, partnered with a facilitator from PG&E's Learning Academy, to lead the workshops.³³
- Over 4,500 leaders attended, from crew foremen to the CEO.³⁴ **Exhibit VIII-8** summarizes number of workshops and attendees by year.

²⁸ DR 32 Attachments 5-CONFIDENTIAL and 6

²⁹ DR 768 Attachment 1

³⁰ DR 45

³¹ DR 568

³² DR 25 All Attachments

³³ DR 568

³⁴ DR 45 and DR 768 Attachment 1

Exhibit VIII-8
PG&E Safety Leadership Workshop Attendance

Year	Number of Attendees	Number of Workshops
2012	1,407	60
2013	3,143	127
2014	151	6
Total	4,701	193

Source: DR 568.

3. The Safety Leadership Development Program delivered from 2014 to 2016 has a positive impact on safety culture, but it did not include training for crew foremen.

- The SLD program is for operational leaders and consists of six safety leadership workshops, a 360-degree feedback process, and in-field coaching with safety leadership coaches.³⁵ The expected outcome of the workshops is to:
 - Meaningfully engage employees on safety issues
 - Help employees identify and minimize exposure to unsafe conditions
 - Counteract at-risk behaviors by significantly increasing positive reinforcement of desired behaviors.³⁶
- In 2014 and 2015 an external consultant provided the in-field coaching services and led the workshops. In 2016, PG&E assumed these responsibilities and currently has six Safety Leadership Coaches who work in six PG&E regions. PG&E Safety Leadership Coaches have an average of 20 years of safety experience. It is their job to deliver workshops and provide one-on-one coaching.
- An overview of the workshops is shown in **Exhibit VIII-9**. Each of the workshops has specific actions for the participants to work on with their direct-reports.

³⁵ DR 724 Attachment 1

³⁶ DR 290 Attachment 51

Exhibit VIII-9 Overview of Six SLD Workshops

Workshop	Objectives	Take Back to Teams
1. Foundations The relationship between safety, culture and leadership.	<ul style="list-style-type: none"> • Provide a consistent set of terms around creating a strong culture of safety and the importance of focusing on exposures vs. incidents. • Introduce a new definition of safety (controlling exposures for self and others), talk about how culture is influenced and shaped by level of risk tolerance and behaviors demonstrated by its leaders. • Provide an opportunity to introduce the full picture of the Leading with Safety Program of activities. 	<ul style="list-style-type: none"> • Talk about the exposures in their work areas. • Identify exposures in terms of conditions, systems and procedures, and at-risk behaviors. • Focus conversations on at-risk behaviors (what you can see and hear). • Have a conversation with your team about safety culture and where on the safety continuum they are. • Develop your personal safety vision and practice how you communicate this.
2. Safety Connections Interaction with frontline employees, initiated by a supervisor or manager in which exposure is observed, feedback is provided, and a discussion is held to strengthen understanding of exposures	<ul style="list-style-type: none"> • Improve supervisor ability to observe safe behaviors and provide feedback and to improve engagement capability. • Ability to note exposures, provide success and guidance feedback and engage the employee in a productive discussion about exposure. 	<ul style="list-style-type: none"> • Conduct effective safety discussions whenever you engage with your team. • Identify good safety behaviors and provide positive feedback. • Give guidance feedback when at-risk behaviors are demonstrated. • Ask open-ended questions about safety exposures at the end of any safety connection.
3. Job Safety Briefings (JSB) Interactions focusing on specific safety requirements, instructions and exposures associated with a work task.	<ul style="list-style-type: none"> • Reviewing a four step process for conducting effective JSBs. • How best to best mitigate identified exposures. • Anticipate and identify pause prompts that may require a crew to stop and reassess prior to proceeding. • Effectively debrief post-task for learnings or success factors. 	<ul style="list-style-type: none"> • Talk with your team about “Pause Prompts,” promote their use and ask about some results. • Ask open-ended questions to use effective communication and collaboration.
4. Physical Hazard Inspection A workplace inspection and discussion used to assess the physical conditions and conditional risks to employee, contractor and public safety.	<ul style="list-style-type: none"> • Apply the steps Physical Hazard Inspection. • Know the most common physical hazard categories. • Learn to discuss with employees hazardous practices that may have been in place for a long time (risk tolerance) and the importance of controlling physical hazards. 	<ul style="list-style-type: none"> • Use the “3-level inspection” method during your next visit to the field. • Hold a team meeting and use the “what-if” exercise to gain insight from the group. • Practice the elements of an “action-oriented leader” that you would like to improve. • Your Safety Leadership coach can work with you in the field as you do Physical Hazard Inspections.

Workshop	Objectives	Take Back to Teams
5. Understanding/ Influencing Behavior Behavior is the heart of leadership and safety. Understanding what drives behavior will help us influence it.	<ul style="list-style-type: none"> • Explain why people do what they do and understand the safety/work-behavior dilemma. • List analysis steps and outcomes. • Use analysis on practical, real-life examples. • Identify an individual behavior to change, and develop a plan to influence antecedents and consequences to change behavior. 	<ul style="list-style-type: none"> • Carry out an analysis with your peers on an area of safety that needs improvement. • Share lessons learned from the workshop with your manager and direct reports. • Use the analysis to help determine what drives/drove a behavior.
6. Life Saving Rules PG&E's Keys to Life has a direct impact on serious injuries and fatalities.	<ul style="list-style-type: none"> • Apply the steps for verifying that life-saving rules are followed correctly. • Explain the three types of verification for life-saving rules. • Set clear expectations and consequences. • 	<ul style="list-style-type: none"> • Review a Keys to Life procedure and then visit a location to observe how the procedure is followed. • During a site visit, identify what measures you can take to ensure that Keys to Life procedures are understood and followed. • Share your expectations for everyone to follow: Each Task, the Right Way, And Every Time. • Walk through a Keys to Life procedure with your team.

Source: DR 231 Attachment 1.

- The SLD program began delivery in 2014.
 - Officers and Directors took the half-day Leading with Safety workshop together. The Officers and Directors of Core LOBs received a 360-degree assessment and coaching.
 - Supervisors and Managers with operational responsibility participated together in six full-day workshops over an 18-month period and received two 360-degree assessments and in-field coaching.³⁷
- **Exhibit VIII-10** shows a breakdown of employees who completed the SLD workshops as of June 10, 2016, by position and job title. As intended, the majority of employees are superintendents, supervisors, and managers.

³⁷ DR 21 Supplement 1 Attachment 1 and DR 50 Attachment 2 – CONFIDENTIAL

Exhibit VIII-10
Breakdown of Employees Who Completed SLD Workshops
as of June 10, 2016

Position/Job Title	½ Day Workshop	Workshop					
		1	2	3	4	5	6
	Leading With Safety	Foundations	Safety Connections	Job Safety Briefing	Physical Hazard Inspection	Understanding/Influencing Behaviors	Life Saving Rules
Executive							
Chairman	1						
Executive Vice President	2						
President	1						
Senior Vice President	14	1					
Vice President	37						
Total	55	1					
Management							
Director / Sr. Director	272	22	28	18	16	8	9
Business Analyst/Specialist/Project Manager	1	15	13	9	9	1	2
Other	42	35	35	16	14	10	12
Engineer/Field Engineer		12	6	6	5	1	3
Supervisor/Superintendent		872	788	683	546	176	364
Manager/Program Manager/Sr. Manager	19	223	233	204	173	63	128
Total	334	1179	1103	936	763	260	518
IBEW T200							
Gas Service Representative		9	7	2	1		
Other	0	14	16	8	8	0	3
Foreman/Crew Leader/Sub-Foreman		2	2	1		1	2
Meter Reader/Senior Meter Reader		8	6	2	2	2	2
Total		33	31	13	11	3	7
IBEW T300							
Other	1	3	2				2
Foreman/Crew Leader/Sub-Foreman		5	4	3	2	1	2
Total	1	8	6	3	2	1	4
Other	2	38	31	18	13	3	11
Grand Total	392	1249	1163	967	789	267	538

Source: DR 222 Attachment 1.

- As shown in **Exhibit VIII-10**, some field personnel (IBEW employees) have taken SLD courses, although the program was targeted for managers and supervisors.

According to PG&E, this may be a result of a temporary upgrade into a management position.³⁸

4. Many individuals that do not lead teams received Safety Leadership Development training before PG&E began safety leadership training for crew foremen.

- **Exhibit VIII-11** provides a breakdown of the LOBs and others that have received SLD training,

Exhibit VIII-11
SLD Workshop Completions by LOB/Sub-LOB
As of October 20, 2015

LOB/Sub-LOB	Workshop					
	1	2	3	4	5	6
	Foundations	Safety Connections	Job Safety Briefing	Physical Hazard Inspection	Understanding/Influencing Behaviors	Life Saving Rules
Human Resources (2015) [Note]						
PG&E Academy	1					
Human Resources					1	
Customer Operations (2014 – 2016)						
Customer Care Immediate Office	1	1	1			
Customer Operations (incl. meter readers)	64	60	50	53	49	53
Customer Service				1	2	1
Electric Strategy & Asset Management (2016)						
Central Engineering		2	5			
Compliance and Risk Management	1	5	6	1		
Technology and Info Strategy	1	9	7			
Electric Transmission & Distribution (2016)						
Asset Management (includes Veg Mgmt.)		2	6	18	5	12
Distribution Operations	7	3	46	70	76	76
Emergency Preparedness and Operations	3	5	10	5		1
Immediate Office (incl. Safety Specialists).						4
Integrated Customer Delivery	4	17	15	10	6	11
Safety	3		6	2	8	5
Service Planning and Maintenance	4	37	49	27	14	25
Transmission Operations	7	38	55	56	29	57
Electric (2014 – 2015)						
Distribution and Transmission Operations	366	294	198	130	53	53
Strategic Business Management	1	1				
Transmission Operations	132	89	52	17		16
Asset Management (includes Veg Mgmt.)	48	25		1		

³⁸ 3/6/2017 email from Janet Redmond to Liz Lemkul

LOB/Sub-LOB	Workshop					
	1	2	3	4	5	6
	Foundations	Safety Connections	Job Safety Briefing	Physical Hazard Inspection	Understanding/Influencing Behaviors	Life Saving Rules
GEN Power Generation Operations	85	78	70	61		64
Gas (2014 – 2016)						
Engineering, Construction & Operations (EC&O) Major Projects and Programs	1		1			
EC&O Super Gas Ops			1	2		2
Gas Distribution Maintenance & Construction	49	47				
Gas Engineering, Construction and Operations	229	203	189	175	59	83
Gas Financial and Resource Management	1					
Gas Operations Asset and Risk Management	1	3	1	1		1
Gas Operations T&D Construction	59	49				
Gas T&D Operations	5	17	60	66	63	131
Engineering and Design		10	42	43	22	42
Gas T&D Construction		4	11	12	12	19
Asset & Risk Management		1	1	3		2
EC&O Major Projects and Programs	1		1			
Gas Business and Performance Management						
Quality Management		1			1	1
Generation (2016)						
GEN Immediate Office (incl. Safety Spec.)	2	4	4			7
GEN Power Gen Projects & Asset Mgmt.				3	20	
GEN Power Generation Operations		1	3	11	52	5
Information Technology (2015 - 2016)						
Enterprise Change	1	1				
IT Infrastructure & Operations	19	18	17	18	18	18
Safety & Shared Services (2014 - 2016)						
Corporate Real Estate	12	12	11	10	11	11
Immediate Office	1					
Safety, Health and Environment	61	55	57	51	45	55
Supply Chain/Materials	39	39	37	36	35	30
Transportation Services	29	28	27	15	18	17
Workforce Health (Safety Specialists)		19			2	
Grand Total	1237	1178	1038	898	602	803

Note 1: Dates reflect dates of organizational changes and also indicate the year courses were taken.

Source: DR 460 Attachment 1, DR 1 Supplement 1, NorthStar Analysis

- As shown in **Exhibit VIII-11**, some personnel who received SLD training were from organizations that do not have field responsibilities, positions that do not lead crews/teams or have a physical workforce including:

- Safety & Shared Services. Training participants included:

- Administrative Clerk

- Aircraft Mechanic
 - Aircraft Pilot
 - Business Analyst, Principal
 - Equipment Mechanic
 - Field Mechanic Inspector
 - Fleet Information Services Specialist, Senior
 - Manager, Aircraft Operations
 - Manager, Regional Fleet Operations
 - Supervisor, Aircraft Operations
 - Supervisor, Area Fleet Operations.
 - Lead Driver
 - Manager, Materials
 - Materials Distribution Flow Coordinator
 - Materials Lead
 - Operations Performance Manager, Senior
 - Senior Manager, Transportation & Logistics Improvement
 - Supervisor, Materials
 - Truck Driver Light – Materials.
- IT Infrastructure and Operations.
 - Gas Finance and Resource Management.
 - Gas Asset and Risk Management.
 - Electric Strategic Business Management.³⁹
- This is not to say that these organizations should not receive the SLD training; only that their training may have impacted the timing and amount of safety culture training in the field organizations.
- 5. PG&E delivered a Crew Leadership Program in 2014 and 2015, which addressed leadership skills, but did not specifically focus on safety leadership.**
- PG&E delivered a Crew Leadership Program (CLP) in 2014 and 2015. The CLP was paused in 2016.⁴⁰ Starting in 2017, Leading Forward Program 2: Safety Leadership, will replace the CLP.⁴¹
 - The CLP was two-day program, with approximately 3 weeks in between the sessions, in which Crew Leads addressed real-world situations faced in the field. The course format was highly interactive, with a minimum of lecture, considerable hands-on learning, and peer discussion.⁴² As explained in the CLP training materials, the objectives of the course were to:
 - Clarify your role as Crew Lead at PG&E

³⁹ DR 460 Attachment 1 and NorthStar Analysis.

⁴⁰ DR 713

⁴¹ DR 713

⁴² DR 348 Attachment 1

- Build up core leadership skills to support safety, quality and customer service
 - Translate learning into actions.⁴³
- As shown in **Exhibit VIII-12**, the CLP curriculum did not specifically address safety leadership.

Exhibit VIII-12
Crew Leadership Program Curriculum - 2014 and 2015

Topic	Objectives
Day 1	
Making a Difference <ul style="list-style-type: none"> • Circle of Influence • Personal Accountability • It's all about the Team • The Crew Lead as a Role Model 	Review and understand the circle of influence. Summarize the accountability model and the phases within each level. Describe your role as an individual with choices to travel down either path within the Accountability Loop. Create specific actions or goals for stretching, or increasing personal and team accountability. Identify how you hold yourself accountable and model that for your team.
Improving Your Team with Communication <ul style="list-style-type: none"> • Listening • Communication Styles • Navigating Tough Conversations 	Understand the importance and impact of communication upon leadership. Define your different ways of communicating (verbal, physical, language). Discriminate between various communication styles. Identify and discuss ways in which listening and questioning skills impact message, trust, team, and leadership. Identify your communication preference. Predict the appropriate situations for using particular communication styles. Evaluate team communication types and their impact upon the team function. Create a plan for improving communication (language and listening) skills. Practice your communication types, modes, & skills. Share your best practices for communicating with your team.
Day 2	
Leader as Coach <ul style="list-style-type: none"> • Key Coaching Behaviors • Question Types 	Practice interdependent team activities. Review the importance of team roles and activities. Identify the role of a coach and practice your coaching skills. Define open and closed-ended questioning. Practice the two types of questioning.
Tapping into Motivation <ul style="list-style-type: none"> • Types of Motivation 	Share your personal work motivation, and your motivation as a leader. Define internal and external motivation. Identify different ways to motivate team members & direct reports.
Giving Feedback <ul style="list-style-type: none"> • A Method for Giving Feedback 	Define positive and constructive feedback. Practice and refine methods for giving feedback. Share best practices situations/scenarios for soliciting and giving feedback. Understand and practice the "SAI it" model (Situation Action Impact). Practice coaching in a team activity.
Building Trust with your Team	Define the importance of trust in at all levels of the organization. Understand the role of trust in interdependent activities. Define the role of trust in highly effective teams. Identify ways in which they will implement trust building or improve trust in their daily role as a leader.

Source: DR 32 Attachments 12 to 14, DR 570.

⁴³ DR 032 Attachment 14

6. PG&E plans to implement a safety training program for crew leaders in 2017, but the training will not be complete until the end of 2019. Although PG&E does not plan to implement Leading Forward Course 2: Safety Leadership for crew leads until 2017, the safety leadership training program should help to promote an improved safety culture in the field.

- In 2016, PG&E, in conjunction with union representation and an outside consultant, began designing the additional safety development courses for non-management field leadership (e.g., crew foreman).⁴⁴ This program will be delivered as Leading Forward Course 2: Safety Leadership. Key topics will include:
 - Identifying and controlling exposures.
 - Recognizing how performing all elements of a Physical Hazard Inspection can reduce exposures and improve worksite safety.
 - Recognizing how performing all elements of a Job Safety Briefing can reduce exposures and improve worksite safety.
 - Recognizing the key role of crew leads in building a culture of safety.
 - Practicing how to effectively deal with others' at-risk behavior.
 - Identifying the tools and resources to support PG&E's safety culture.⁴⁵
- All leaders (crew leader and above) in the six operational lines of business who supervise field employees will participate in Leading Forward Program 2: Safety Leadership. The six lines of business are:
 - Electric Transmission and Distribution
 - Power Generation
 - Gas Operations
 - Safety and Shared Service
 - Customer Care
 - Information Technology.⁴⁶
- Superintendents/Managers will facilitate the sessions with Leadership and Employee Development instructors.⁴⁷
- Vice Presidents and Directors will participate as "engagement leaders" and receive a targeted version of the training first.⁴⁸ In late 2016, PG&E was currently developing a workshop to be delivered to Officers and Directors whose employees will participate in the new Leading Forward Program 2: Safety Leadership. The Officer and Director workshop will:

⁴⁴ DR 314 Attachment 1

⁴⁵ DR 177

⁴⁶ DR 460 Supplement 1

⁴⁷ DR 575 Attachment 1

⁴⁸ DR 575 Attachment 1

- Focus on enhancing knowledge of the field skills that will be taught to the front-line leaders in Leading Forward Program 2, and how those senior leaders can effectively reinforce the safety message that their employees will receive in Leading Forward Program 2.
 - Provide the groundwork necessary for the officers and directors to be competent engagement leaders in Leading Forward Program 2.⁴⁹
- PG&E plans to have 125 officers and directors participate in this workshop between January 30 and March 31 of 2017, with a focus on those officers and directors leading organizations of field employees.⁵⁰
 - Based on its capacity to deliver the program as designed, PG&E expects crew leaders and supervisors in the Electric T&D, Gas Operations, Generation, IT, Customer Care, and S&SS LOBs (approximately 2,075 employees) to complete the new safety leadership training under the Leading Forward Program by the end of 2019.⁵¹
 - Following the initial rollout, the training will continue as a sustained program for new leaders, with the requirement that each leader complete the training once during his career.
- 7. PG&E safety leadership training and coaching assessments rely on the Kirkpatrick Level 1 Training Assessments, which measure the participant experience, but do not measure the impact of training on job performance.**
- PG&E states that effectiveness of the SLD program is measured in the following manner:
 - Level 1 Training Assessments.
 - 360-Degree surveys conducted pre- and post-participation for many of the SLW participants.
 - Comparison of 2017 diagnostic results to previous results. In 2013 and 2014, PG&E conducted an assessment using a consultant's Organizational Culture Diagnostic Instrument (OCDI). PG&E is currently evaluating whether or not to conduct this same assessment in 2017 to measure change.⁵²
 - The Level 1 assessment measures how trainees, reacted to the training, including the instructor, the topic, the material, its presentation, and the venue. The Level 1 assessment allows PG&E to understand how well the training was received by the participants and identifies areas or topics that are missing from the training. The survey questions use a five level scale with Strongly Disagree as 1 and Strongly Agree as 5, and are as follows:

⁴⁹ DR 575

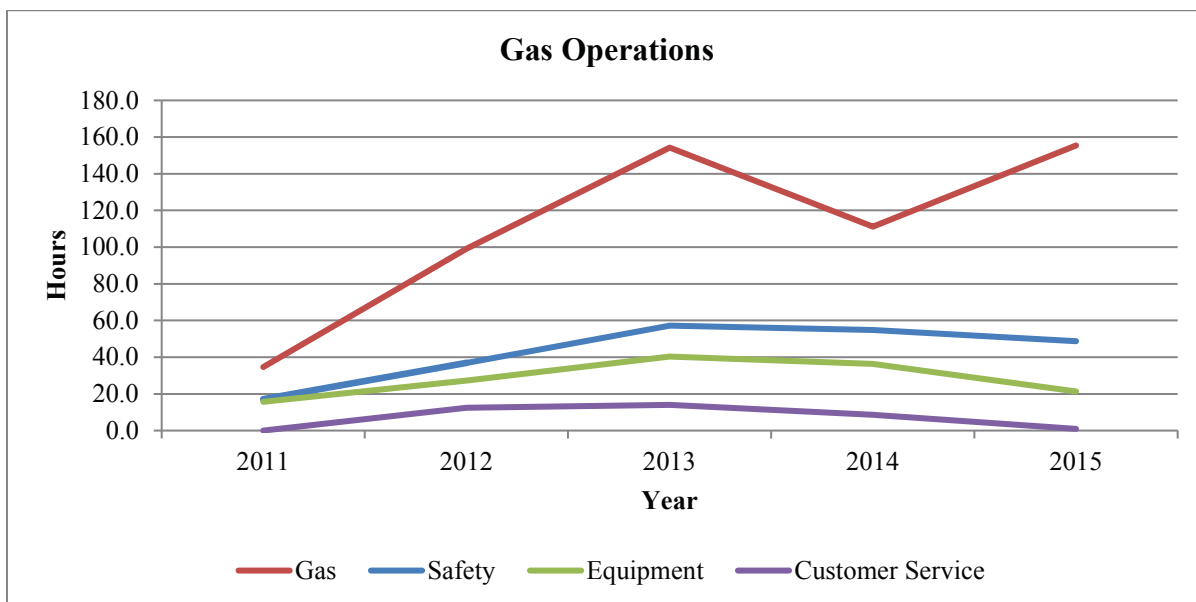
⁵⁰ DR 575

⁵¹ DR 577

⁵² DR 258

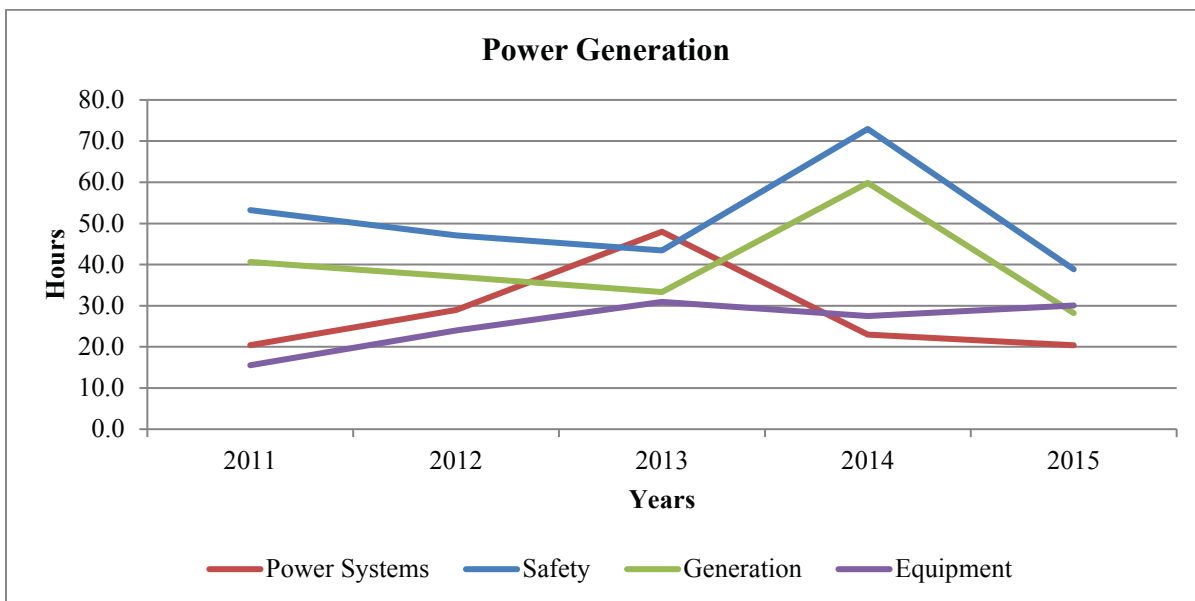
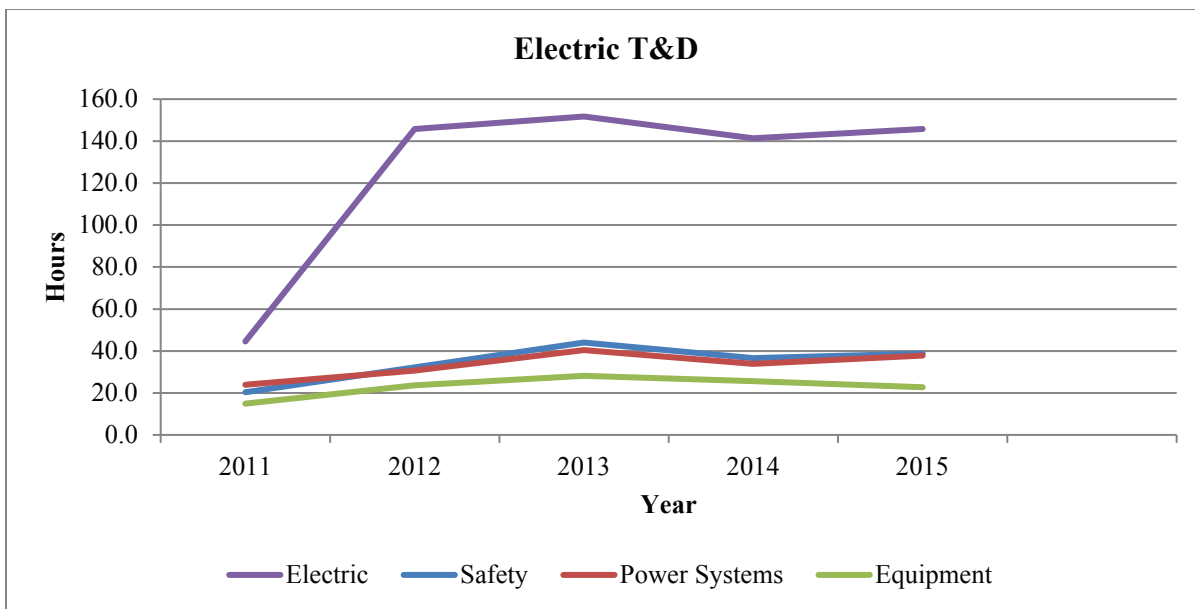
- The instructor was knowledgeable about the subject.
 - The instructor was prepared and organized for the training.
 - The instructor's energy and enthusiasm promoted class participation and interactive learning.
 - The instructor's teaching methods, style and pace helped me to learn.
 - The instructor promoted appropriate safety practices as necessary throughout the training. If this is not applicable, select N/A.⁵³
- PG&E did not provide NorthStar with any comparisons of pre- and post-training 360-Degree Survey results.⁵⁴
8. **The amount of Gas Operations and Electric T&D technical training has increased since 2011; however, the average hours of technical training in Power Generation has decreased.**
- As shown in **Exhibit VIII-13**, the average annual technical training hours for gas, and electric field employees increased from 2011 to 2015.

Exhibit VIII-13
Average Hours of Annual Training per Field Employee [Note 1]



⁵³ DR 22

⁵⁴ DR 258



Note 1: These charts show averages for the top four training categories in each LOB in the 2011 to 2015 period. They do not show all training subject areas. Some of the employees who would be in Power Generation in 2016 would have been reported under the Electric LOB in 2015 due to the organization structure in effect at the time. PG&E estimated the average hours of training based on the course duration values maintained in PG&E's Learning Management System. Training hours identified as "Safety" reflect courses where the primary focus is safety. Safety training may be embedded in technical training.
Source: DR 293 Attachment 1, NorthStar Analysis.

- As shown above, for Power Generation field employees, the annual average hours of safety and power systems training decreased from 2011 to 2015, although there was a spike in safety training in 2014.
- The increase in safety training in 2014 is primarily due to 390 additional total days of Safety at Heights training, and 91 additional total days of Confined Space

training. Safety at Heights training changed from a periodic to a one-time requirement, which resulted in reduced training hours for this course after 2014.

- A procedure change drove the increased days of Confined Space training in 2014.⁵⁵

9. PG&E does not require refresher training in some key safety areas.

- The Keys to Life, shown in **Exhibit VIII-14**, are one of the fundamental elements of PG&E's approach to safety, encouraging employees to take responsibility for their personal safety.

Exhibit VIII-14 Keys to Life

To assure your safety and that of your co-workers and the public:

- Follow safe driving principles.
- Use appropriate, life-saving personal protective equipment (PPE).
- Follow electrical safety testing and grounding rules.
- Follow clearance and energy lock out rules.
- Follow confined space rules.
- Follow suspended load rules.
- Follow safety at heights rules.
- Follow excavation procedures.
- Follow hazardous environment procedures.

- While PG&E appropriately requires HAZWOPER (Hazardous Waste Operations and Emergency Response) refresher training on an annual basis, PG&E only requires some of the courses in its Keys to Life safety areas to be taken once, including the following:
 - SAFE-0440: Safety @ Heights: Competent
 - SAFE-0454: Safety at Heights - Authorized Person
 - SAFE-1101: Scaffolding Safety - Authorized Person
 - SAFE-1102: Scaffolding Safety - Competent Person
 - SAFE-1201WBT: Confined Space - Awareness
 - SAFE-1205: Confined Space - Non-Entry Rescue
 - SAFE-1491WBT: PPE
 - Mandatory safety classes for Electric T&D, Gas Operations and Power Generation field personnel are listed in **Exhibit VIII-15**. Some classes are only required to be taken once, while others are required every one or two years.

⁵⁵ DR 738

Exhibit VIII-15
Mandatory Safety-Related Courses for Electric T&D, Gas Operations and Power
Generation Field Workers [Note 1]

• One-Time Training	Annual Training
<ul style="list-style-type: none"> • SAFE-0135: Asbestos-Pipe Wrap and Gaskets Initial • SAFE-0141: Asbestos - Class I/II - Worker - Initial • SAFE-0173: Asbestos - Class III - Maint. Worker Init. • SAFE-0440: Safety @ Heights: Competent • SAFE-0454: Safety at Heights - Authorized Person • SAFE-0615WBT: Heat Illness Prevention Training • SAFE-0891: HAZWOPER - Worker - Initial • SAFE-1101: Scaffolding Safety - Authorized Person • SAFE-1102: Scaffolding Safety - Competent Person • SAFE-1201WBT: Confined Space - Awareness • SAFE-1205: Confined Space- Non-Entry Rescue • SAFE-1290WBT: Portable Ladder Safety • SAFE-1491WBT: PPE • SAFE-1504: Lead Awareness for Construction • SAFE-1505WBT: Arc-Flash Hazard Control Basics • SAFE-9017WBT: Globally Harmonized System 	<ul style="list-style-type: none"> • CORP-0135WBT: Life Safety Training • CORP-0804WBT: Cyber and Physical Security Awareness • SAFE-0136: Asbestos-Pipe Wrap and Gaskets Refresher • SAFE-0151: Asbestos - Class I/II - Worker - Refresh • SAFE-0172: Asbestos Class III Maint Worker Refresh • SAFE-0174: Asbestos - Class IV - General Awareness • SAFE-0211WBT: Blood-borne Pathogens • SAFE-0395: Ergonomics - Industrial Training • SAFE-0409WBT: Office Ergonomics WBT • SAFE-0511WBT: Fire Extinguisher Training • SAFE-0731WBT: Hearing Conservation • SAFE-0892: HAZWOPER - Worker - Refresher • SAFE-1100: Respiratory Protection • SAFE-1503WBT: Utility Std TD-1464S Fire Danger
	Biennial Training <ul style="list-style-type: none"> • SAFE-0408WBT: Office Ergonomics WBT • SAFE-0439WBT: First Aid Awareness Level • SAFE-1506: First Aid/CPR and A.E.D. Certified Medic

Note 1: Courses profiled to IBEW employees as of August 19, 2016, based on job.

Source: DR 436 Attachment 1, DR 293 Attachment 1, NorthStar analysis.

10. PG&E developed training on Human Performance tools, but this training was not profiled to any employees in 2016. An 8-hour “Intro to Human Performance” class was developed in about 2014 for employees in the Electric T&D organization, but has not been offered since.

- Human Performance tools include:
 - **Tailboards.** Conduct a tailboard before performing work to discuss tasks involved, hazards and related safety precautions. A tailboard is a collaborative discussion between the person in charge and the team conducting the work.
 - **Self-Checking S.T.A.R. (Stop, Think, Act, and Review).** Self-Checking helps ensure that the action being taken is correct before using any equipment and is an expected standard of performance for all employees.
 - **Two-Minute Rule.** The key objectives of the Two-Minute Rule are to improve a person’s situational awareness when working, when beginning a task or to check for changing conditions when returning from a break. Explore the work area by walking and looking around it (near the hands-on touch points) and its adjacent surroundings. Talk with co-workers or the supervisor about unexpected hazards or conditions and the precautions to take. Eliminate hazards, install appropriate defenses or develop contingencies before proceeding with the work.
 - **Questioning Attitude.** A questioning attitude fosters situation awareness, encouraging thought about safety before action is taken. 1) Stop, Look, and Listen – Proactively search for work situations that create uncertainty. 2) Ask

questions. 3) Proceed if sure – Continue the activity if the uncertainty has been resolved with facts. 4) Stop when unsure.

- **Stop When Unsure.** Whenever a question arises, creating uncertainty, stop and ask. Every person has the responsibility and authority to stop work when uncertainty exists.
 - **Phonetic Alphabet.** Use the phonetic alphabet when communicating alphanumeric information relating to equipment and components.
 - **Three-Way Communication.** Three-Way Communication promotes a reliable transfer of information and understanding, ensuring that the correct action is taken. 1) Sender states the message; 2) Receiver repeats the message; 3). Sender acknowledges the receiver's reply and either confirms or re-instructs. 4) If re-instructed, the three-way communication process starts over at step two.
 - **Placekeeping.** Placekeeping is the process of documenting that a procedure step has been completed, and in the correct sequence.
 - **Procedure Use and Adherence.** Understanding the overall purpose and strategy of the procedure promotes safer outcomes. Work is to be performed in accordance with approved procedures, work instructions, and policies⁵⁶
- NorthStar's review of training records reveals that no one was profiled for this course, in 2016.⁵⁷
 - PG&E states that "Intro to Human Performance" class was developed approximately two years ago for employees in the Electric T&D organization and that the Livermore Academy instructors are currently being certified to deliver this class so that more instructors are available to deliver this course in the future.⁵⁸
 - Although the "Intro to Human Performance" was not profiled in 2016, 51 employees took Human Performance courses, including the following
 - 22 completed a Human Performance Train the Trainer course
 - 22 completed the training required to obtain their Human Performance Certification.⁵⁹
 - PG&E states that most of its technical training includes segments on the use of human performance tools appropriate for the tasks that are being trained.⁶⁰
 - Human performance tools are cited, but not listed on the Electric T&D List of Tailboard form. According to PG&E, the expectation for human performance tools during tailboard discussions is that the crew will discuss appropriate human

⁵⁶ DR 394

⁵⁷ DR 436 Attachments 1 and 2

⁵⁸ DR 394

⁵⁹ DR 352 Supplement 1

⁶⁰ DR 394

performance tools for the tasks they are performing and how they would implement the tools effectively.⁶¹

- According to PG&E, employees gain knowledge of the human performance tools through interaction with their supervisor and Human Performance specialists and through reference materials provided by PG&E.
 - The “Pacific Gas and Electric Company Safety and Performance Fundamentals Handbook” includes information about human performance tools. The handbook was condensed to a pocket size and issued to interested parties starting in 2012, and eventually issued to all field employees.
 - The handbook is currently being revised by the Corporate Safety organization. The new handbook will be titled “Serious Injury and Fatality Field Guide” and expected for distribution in late 2016 or early 2017. This updated field guide will include topics such as safety at heights, confined space, and human performance tools.
 - PG&E has a human performance intranet site where employees can find information.⁶²

11. PG&E’s Gas Operations training program effectively covers design and operation of the gas system, skills development, hazard identification, and associated safety requirements.

- There are clear lines of progression from the Utility Worker position into four organizations in Gas Operations.
 - Building Department
 - Gas Pipeline O&M
 - General Construction
 - Transmission and Distribution.⁶³
- It typically takes three years to progress from utility worker to journeyman level/senior technician level. Progression includes both formal classroom instruction and on-the-job field training. Employees must pass classroom and field competency testing and meet the minimum time in position to move onto the next training unit.⁶⁴
- **Exhibit VIII-16** provides examples of safety training for representative field gas positions. Typical components to these safety modules include PPE, tools and equipment, use of specific equipment, and other safety considerations.

⁶¹ DR 394

⁶² DR 394

⁶³ DRs 420 All Attachments; IRs 105 and 174

⁶⁴ DR 457 All Attachments and IR 174

Exhibit VIII-16
Sample Safety Training in Course Curricula by Position

Gas Control Technician	Apprentice Welder	Apprentice Fitter Arc	Journeyman Welder
<ul style="list-style-type: none"> • Gas Clearances • Lock Out/Tag Out • Handling of Liquids • Combustible Gas Indicator • Personal Atmospheric Pressure • Traffic Control • Air Movers • Maintenance and Safety • Handling of Natural Gas • Overpressure Protection 	<ul style="list-style-type: none"> • Oxyacetylene Safety • Shielded Metal Arc Welding – • Bellhoe & Jobsite Safety • Excavation Safety • Welding Vehicle Safety • Back Welding • Trench Safety • Safety at Heights 	<ul style="list-style-type: none"> • Welding, Cutting and Grinding • Fire and Explosion • Oxyacetylene Safety 	<ul style="list-style-type: none"> • Code of Safe Practices • PPE • Hazards and Fire Protection • Tools and Equipment • Grinder Safety • Vehicle Safety • Excavation Safety • Fire Extinguisher • First Aid • Cone Safety

Source: DR 457 All Attachments

12. PG&E's employee operator qualification program is well-developed and administered in compliance with CFR 49 Part 192 Subparts E, F and N.

- PG&E's does not permit employees with expired OQs to perform work independently on the system.
- PG&E's most recent OQ plan is dated June 2014. The June 2014 revision reflects an increased focus on safety. In particular:
 - Requalification for Subpart N (other than welding and fusion) is now every three years. Prior to San Bruno, requalification was required every five years. This provides PG&E an opportunity to more frequently reassess field skills and correct any deficiencies.⁶⁵
 - Increased the number of OQs by 51, permitting a more discrete definition of work task and definitive testing for competency. The increased qualifications are for Subparts E, F and N.
 - Required all tests to be administered in English.⁶⁶
- 49 CFR Part 192 Subpart E stipulates the pipe welding qualifications and 49 CFR Part 192 Subpart F stipulates the plastic pipe fusion qualifications. In compliance with these section, PG&E:
 - Has incrementally expanded the testing requirements from the minimum CFR requirements. Subparts E and F are specified as a skills test in CFR 49. PG&E has expanded its welding operator and plastic fusion operator qualification program to include a verbal knowledge component that will eventually become a

⁶⁵ DR 58 – All Attachments

⁶⁶ IR 91

written exam. The verbal portion of the test assesses general knowledge, general practices, and safety requirements.⁶⁷

- Uses destructive testing of all welds and plastic fusions for requalification tests rather than just inspecting the welds and fusions.⁶⁸
 - Has a dedicated welding testing team separate from the Learning Academy. The testing team travels from service center to service center throughout PG&E's service territory. All welding operators are required to re-certify annually.⁶⁹
 - Has a dedicated plastic-fusion testing team separate from the Learning Academy. The testing team travels from district to district throughout PG&E's service territory in a mobile testing vehicle. All plastic fusion operators are required to re-certify annually.⁷⁰
 - Has a high pass rate for requalification exams. If an employee fails to requalify, they may retest twice at 30 day intervals after which time the employee is subject to dismissal or sent to the learning center for additional training.⁷¹
- NorthStar attended a plastic pipe fusion OQ testing and found the testing to be adequate:
 - The mobile plastic test van was on site.
 - Destructive tests were done on all fusions.
 - A general knowledge oral exam was administered to each candidate.
 - The instructors did not provide advice or assistance during the test.
 - Candidates were tested for procedural compliance as well as safety.⁷²

13. PG&E responds to employee OQ failures or when a current installation or construction method has been found to be unsafe.

- When an employee fails to requalify after multiple attempts, PG&E will re-dig a sample of the employee's work to verify that the installation/repair was done correctly.⁷³
- When a current installation or construction method is found to be unsafe, PG&E will suspend all OQs associated with the process until a solution is found and associated employees can be retrained and tested.
 - In 2016, PG&E determined that the cleaning process for plastic fusion was inadequate. All plastic fusion OQs were revoked for 3 months until the employees completed new training and passed a revised OQ test with the new procedure.⁷⁴

⁶⁷ IRs 91 and 121

⁶⁸ IR 121

⁶⁹ IR 91 and 121

⁷⁰ IR 91 and 121

⁷¹ DR 457

⁷² IR 121

⁷³ DR 419

⁷⁴ DR 769, IR 91

- In 2014, PG&E discovered that some of their employees with plastic fusion OQs had not completed all required training. PG&E revoked the OQs of the employees in question until they completed training and passed the OQ exam.⁷⁵

14. PG&E has limited oversight over contractor Subpart N operator qualifications.

- PG&E administers annual qualification examinations for welding and plastic fusion (Subparts E and F). Contractors must pass this examination to work on the PG&E system.⁷⁶
- Subpart N (everything but welding and plastic fusion) operator qualifications for contractor's employees are administered by Veriforce.⁷⁷
 - Veriforce is a Texas-based third-party operator qualification content and administration service.
 - Veriforce provides instructor-led training for OQs in seminars conducted throughout the U.S.⁷⁸
- Contractor employee skills testing is provided by third-party testers that have been vetted by Veriforce.⁷⁹
- Re-testing for operator qualifications is managed by contractors. PG&E relies on the contractors to ensure that their employees have valid training and current operator qualifications.⁸⁰
- PG&E's role in the contractor OQ process is limited to:
 - Evaluating Veriforce course content
 - Reviewing Veriforce testing procedures
 - Reviewing field audits conducted by Veriforce.⁸¹

15. Contractors performed work on the PG&E system without valid operator qualifications. PG&E self-reported the incidents, did not perform a thorough review to determine whether the lapsed contractor OQs were an isolated incident.

- In 2011, 2012 and 2013 PG&E used a contractor to perform contractor OQ status checks. In 2014, PG&E required contractors to hold appropriate qualifications but did not have a formal process to verify the operator qualifications.⁸²

⁷⁵ <http://www.mercurynews.com/2014/07/09/pge-discovers-training-flaws-for-pipeline-workers/>

⁷⁶ IR 91

⁷⁷ DR 307

⁷⁸ www.veriforce.com

⁷⁹ DR 307

⁸⁰ DR 682

⁸¹ DR 307 and DR 307 Attachments 1-3

⁸² DR 652 and DR 652 Attachments 17-19

- In February, May and November 2014, 243 PG&E contractor employees performed over 500,000 atmospheric corrosion inspections with expired OQs.⁸³
- Upon becoming aware of this situation in November 2015, PG&E re-inspected the pipes in question and found over 18,000 cases of severe corrosion.⁸⁴
- PG&E self-reported the 2014 instances of tasks performed on the system with invalid operator qualifications to the CPUC on September 14, 2016.⁸⁵
- PG&E did not conduct any further internal analyses to determine if this problem was isolated to one contractor or to all contractor OQ work. PG&E did report on expired OQs related to cross-bore inspections as a result of a whistle-blowing and confidential complaint to the CPUC.⁸⁶

16. PG&E has implemented new safeguards to prevent further incidences of invalid contractor operator qualifications. However, the corrective actions do not prevent OQ expiration during the contract period.

- PG&E's notification included a detailed description of the occurrences and list of corrective actions to prevent this from occurring in the future. Corrective actions included:
 - Establishment of a third-party contractor verifying OQ status
 - Monthly screening reports from inspectors
 - Training of contractor personnel on the correct procedure for inspecting for atmospheric corrosion.⁸⁷
- PG&E implemented the remedial measures as stated. NorthStar reviewed and found:
 - PG&E now uses Veriforce to verify the OQ status of contractors and develops monthly screening reports.⁸⁸
 - The training classes for procedure TD 4188P-01 were conducted as shown in **Exhibit VIII-17**. Training was conducted on six separate occasions with a total of 112 participants. Fewer than half of the 243 inspectors that were performing inspections with expired OQs took the class.⁸⁹

⁸³ September 14, 2016 Letter of Self Report ALJ-274, Falk to Bruno and <http://www.mercurynews.com/2016/12/23/pge-fined-for-illegal-gas-system-inspections/>

⁸⁴ September 14, 2016 Letter of Self Report ALJ-274, Falk to Bruno and <http://www.mercurynews.com/2016/12/23/pge-fined-for-illegal-gas-system-inspections/>

⁸⁵ September 14, 2016 Letter of Self Report ALJ-274, Falk to Bruno

⁸⁶ DR 652 Supplement 1

⁸⁷ DR 652

⁸⁸ DRs 307 and 652

⁸⁹ DR 652 Attachments 14-16

Exhibit VIII-17
PG&E Atmospheric Corrosion Training to Contractors

Date	Contractor	Attendees
February 23, 2016	Underground Construction Company	32
February 24, 2016	Underground Construction Company	29
March 1, 2016	Underground Construction Company	7
February 8, 2016	Alisto Engineering Group	31
February 18, 2016	Alisto Engineering Group	10
July 5 and 6, 2016	E2 Consulting Engineers	3

Source: DR 652.

- PG&E requires contractor employees to possess valid OQs during the onboarding process.⁹⁰ However, this does not prevent OQs from lapsing during the contract period.

17. Gas Operations does not have a comprehensive reporting process that monitors Plastic Qualifications, Welding Qualifications and OQ status.

- Employees are notified prior to Plastic, Welding and OQ expiration dates.
- PG&E administers the OQ program in its Standards and Qualifications Organization, three managerial levels below the VP of Gas Operations.
- PG&E does not routinely issue a comprehensive operator qualification report which tracks the status of key OQ program elements, such as the number of valid OQs, number of OQs tested, number of OQ tests failed, and number of expiring OQs. Employees' OQ status is not reported to the VP of Gas Operations.
- In July 2016, PG&E implemented a mobile OQ card application in which each employee is assigned a card that can be scanned at any time to check the current OQ status.⁹¹ PG&E has not fully determined how this new technology will be utilized (e.g., frequency, reporting, disciplinary actions)
- For Plastic Qualifications and OQ expiration notifications, PG&E's MyLearning generates notifications that are sent to employees and their supervisors at the following intervals, as necessary:⁹²
 - 90 days before the expiration date
 - 60 days before the expiration date
 - 30 days before the expiration date
 - 5 days before the expiration date.

⁹⁰ IR 91

⁹¹ DR 650

⁹² DR 650

- For Welding Qualifications, a centralized qualifications team tracks pending lapse dates via a spreadsheet, and contacts supervisors or the applicable field scheduling coordinator to schedule testing prior to the lapse date. The notifications of scheduled employee testing are sent out via emailed calendar invite.⁹³

18. PG&E Gas Transmission and Distribution Control Center training programs are appropriate.

- PG&E has an eighteen-month in-house training program to become an operator on the PG&E Gas Transmission or Distribution Control Center. The program includes coursework common to Transmission and Distribution as well as course work specific to Transmission or Distribution. In all, there are 45 courses, ranging from basic control room operations and monitoring to Emergency Clearances. The training is technical and process control-oriented.⁹⁴
- PG&E has recently installed remote control valves in key areas of the service territory. PG&E requires all operators to pass a four-hour exam that simulates field conditions that would require the operation of these valves. Operators are also required to participate in an annual table-top exercise with their supervisors to refresh skills.⁹⁵
- PG&E supplements the operator training with detailed SCADA system training. There are fourteen modules of SCADA training:
 - The first ten modules cover installation, configuration, operation and maintenance of remote terminal units and field devices used to collect data from natural gas pipelines.
 - The last four modules cover advanced remote terminal unit (RTU) functionality and troubleshooting.⁹⁶

19. Electric T&D's Journeyman Refresher Training helps maintain awareness of correct and safe work techniques.

- The PG&E Academy delivers Journeyman Refresher Training in two 8-hour training days, typically in the employee's local service center or PG&E's remote training facilities (other than Livermore or San Ramon) by the PG&E Academy's eight-person "Mobile Journeyman Training Team." Each course includes a knowledge assessment based on the learning objectives.⁹⁷

⁹³ DR 651

⁹⁴ DR 269 and Attachments 1-56; IR 83

⁹⁵ DR 268 and Attachments 1-4 - CONFIDENTIAL

⁹⁶ DR 270 and Attachments 1-12, DR 270 Attachment 13-CONFIDENTIAL and DR 270 Attachment 14-CONFIDENTIAL

⁹⁷ DR 393

- The content for the Journeyman Refresher Training is based on a number of factors, including:
 - Input from the field personnel
 - Requests from Electric T&D leadership
 - Trends in work procedure errors
 - Changing standards and procedures
 - Serious incident investigations
 - Identified high risk activities.⁹⁸
- Recent Journeyman Refresher Training topics include:
 - Confined Space
 - Rigging Principals
 - Rubber Gloving
 - Hot Sticking
 - Switching
 - New Equipment Operation
 - Grounding.⁹⁹

20. The Electric T&D Employee Knowledge and Skills program helps ensure experienced qualified electric workers (QEWs) are performing work properly and safely.

- In 2012, PG&E established the Electric T&D's Knowledge and Skills (EK&S) program for the tasks associated with electric transmission and distribution line and substation work. The objective of the program is to determine the workers' baseline performance and to raise workers' awareness regarding the use of proper PPE, using the right tools for the job, following established procedures, and using proven work practices to complete the jobs safely and efficiently.¹⁰⁰
- In contrast to refresher training, the EK&S is an assessment program, not a training program.¹⁰¹
- PG&E's goal is to assess all QEWs who are at journeyman status and above on high risk/high consequence tasks.¹⁰² **Exhibit VIII-18** shows the EK&S assessment areas completed to date.

⁹⁸ DR 393

⁹⁹ DR 393

¹⁰⁰ DR 382

¹⁰¹ DR 675

¹⁰² DR 382 Attachment 1

Exhibit VIII-18
Electric T&D EK&S Assessment Areas

Assessment Activity	Employee Position	Assessment Program Duration
Rubber Glove and Grounding	Distribution Linemen Crew Foremen	December 2012 – June 2014
Patrols and Inspections	Compliance Inspectors	June 2014 – October 2014
Underground Grounding and Switching	Cable Splicers Crew Foremen	September 2014 – October 2014
Rubber Glove and Grounding	Transmission Linemen Crew Foremen	October 2014 – December 2014
Equipment Operation	Restoration Troublemakers Distribution Line Technicians	March 2015 – July 2015
Substation Switching and Grounding	Substation Electricians Crew Leaders	September 2015 – May 2016
Underground Grounding and Switching	Distribution Linemen Crew Foremen Public Safety and Reliability (PS&R) Compliance Inspectors	January 2016 – currently in progress; scheduled to be completed by December 2016
Rigging	Distribution Linemen Crew Foremen Transmission Linemen Crew Foremen PS&R Compliance Inspectors Substation Electricians Crew Leaders	Under development

Source: DR 380.

- The Knowledge and Skills program has two components:
 - 1) Knowledge Assessment (written exam). This exam is open book – the employees may use documents available to them in the field.
 - 2) Skills Assessment (hands-on field exercises). PG&E and IBEW work together to create realistic hands-on assessments. The assessors include subject matter experts (employees who perform the work every day) and an IBEW staff member who are present each day the assessments take place.¹⁰³
- Supervisors also participate in EK&S.
 - They must successfully complete Knowledge Assessments.
 - In the Skills Assessment, they are assessed on their skills in observing crews complete work.¹⁰⁴
- To date, five individuals have lost their QEW status because they did not pass their third attempt at the Skills Assessment.¹⁰⁵ An agreement between PG&E and IBEW

¹⁰³ DR 382

¹⁰⁴ DR 382

¹⁰⁵ DR 381 Attachment 1 and IR 116

outlines the process to be used when an employee does not pass the knowledge and skills assessment. Per the agreement:

- If an employee is not successful on the first attempt, a training plan is put together and delivered.
 - If the employee is not successful on the second attempt, the Labor Relations Manager, IBEW Assistant Business Manager, and the EK&S Manager meet to discuss whether additional training will be offered, or if there is another solution that is acceptable to all parties.
 - If the employee is not successful on the third attempt, the employee may be removed from his job under the provisions of the Collective Bargaining Agreement.¹⁰⁶
- A supervisor may request an individual assessment for an employee. The EK&S leadership works with the supervisor to identify and customize the areas to be assessed.
 - Once a date is selected, the employee is informed verbally of the assessment, as well as through written communication that includes the supervisor, IBEW, and EK&S. Evaluators are assigned, which includes an EK&S Evaluator, PG&E Academy Instructors, an IBEW business representative, and the employee's Supervisor.
 - These individual assessments are not under the aforementioned provisions regarding actions if an employee is not successful demonstrating the basic knowledge and skills of their classification.¹⁰⁷
 - Electric T&D field personnel interviewed by NorthStar found that EK&S program was helpful in maintaining their skills and an awareness of safe practices.¹⁰⁸
 - An agreement between PG&E and IBEW establishes a joint overview committee that works together to identify high risk/high consequence job tasks for PG&E Linemen, Crew Foremen, Compliance Inspectors, Cablemen, and Substation Electricians.¹⁰⁹
 - The Work Methods and Procedures Group and PG&E Academy work together to identify and implement knowledge assessment strategies that test the knowledge and skills needed for employees involved in field work. The program content is created from existing work methods and procedures.¹¹⁰
 - The Electric T&D organization uses Work Procedure Error, RINS, and Observation database information to identify potential knowledge and skill deficiencies for high

¹⁰⁶ DR 425

¹⁰⁷ DR 425

¹⁰⁸ Fire visit, other visit in Auburn

¹⁰⁹ DR 425

¹¹⁰ DR 380

risk/high consequence activities. Examples of this data are near hits of employee injuries, customer reliability issues, and serious injuries or fatalities.¹¹¹

21. PG&E appropriately factors its EK&S results in its Electric T&D training development, modifications to procedures, and the determination of how frequently to conduct the EK&S assessment.

- PG&E tracks the EK&S trends by types of failures and job classification rates, and factors this data into its training development, to emphasize areas with violations.¹¹²
- The performance trends identified are also shared with the Work Methods and Procedures team in Electric T&D, as this aids them with updating procedures to build employee understanding. This approach, along with sharing detailed reports (notifications) with all supervisors, is intended to help raise the level of knowledge and skills of all employees in Electric T&D.¹¹³
- PG&E also shared the EK&S results with an external consultant to determine how often employees should return for an assessment in the same task/skill area.¹¹⁴ The external consultant recommends:
 - Employees return for re-assessment on Rubber Glove and Overhead Grounding procedures on a two-year cycle. This recommendation was based on studies showing that after two years less than 70 percent of the employees successfully completed the assessments.
 - The two-year re-assessment is a baseline and will vary according to the results of each individual employee's assessments. As an example, employees who passed both assessments on their first try will be on a longer re-assessment cycle, while an employee who failed both assessments on the first attempt is considered high risk and will need to be reassessed sooner and possibly more frequently than every two years.¹¹⁵
- PG&E and its consultant plan to conduct additional cycle time studies for other EK&S programs such as Cable Splicer, Troubeman, Underground Grounding and Switching for Line Workers, Rigging, and Substation Grounding and Switching.¹¹⁶

¹¹¹ DR 382

¹¹² DR 424

¹¹³ DR 424

¹¹⁴ DR 424

¹¹⁵ DR 668

¹¹⁶ DR 668

22. The Pre-Apprentice Lineman program, instituted in 2011 as part of PG&E's modified apprentice program, is an effective process to screen for successful apprentice lineman and should help improve safety performance.

- One of the most significant changes to the Electric Lineman Apprenticeship program in 2011 was the establishment of the Pre-Apprentice Lineman (PAL) program.
 - The objective of the program is to identify individuals who demonstrate the mental and physical aptitude required to progress into the Lineman Apprenticeship program and ultimately into the position of Journeyman Lineman which is a highly skilled craft.
 - The twelve-month PAL program provides PG&E an opportunity to assess the Pre-Apprentice's ability to gain, retain, and demonstrate knowledge, skills, abilities and attitudes that are critical in becoming a safe, competent, and productive Apprentice then Journeyman Lineman.¹¹⁷
- Candidates are selected from both internal and external sources. All candidates are screened and assessed prior to being selected to enter the program. Areas of screening and assessment include: aptitude to work at heights, basic knowledge of tools, and use of tools and other physical assessments that assure successful candidates are able to perform required Lineman's tasks. Additionally, candidates are assessed on the attitudes and behaviors that exemplify successful Linemen.¹¹⁸
- Once selected into the program, Pre-Apprentice Linemen are taken through a series of formal training classes and on-the-job experience (OJE). Formal training accounts for approximately 20 percent of the Pre-Apprentice program, with the OJE accounting for the remaining 80 percent of the program.¹¹⁹
- Pre-Apprentice Line Workers (PALWs) complete a Critical Core Weekly Report and review the self-assessment with supervisors and crew foreman on a periodic basis. As shown in **Exhibit VIII-19**, here are 10 critical core assessment areas, including personal safety, worksite safety, and tailboard competence.

¹¹⁷ DR 473 Attachment 4

¹¹⁸ DR 473 Attachment 4

¹¹⁹ DR 473 Attachment 4

Exhibit VIII-19 Critical Core Weekly Report

Pre-Apprentice Line Worker (PALW) Name:		OT:										
Critical Core Attitude & Behavior Area	PALW					Supervisor					Comments/Examples	
	Very Low	Low	Avg	High	Very High	Very Low	Low	Avg	High	Very High		
1. PALW showed up on time to work each day	Does not meet		Meets			Does not meet		Meets				
2. PALW consistently supported other line workers and supervisors during the week	1	2	3	4	5	1	2	3	4	5		
3. PALW independently practiced learned skills to build competency and efficiency	1	2	3	4	5	1	2	3	4	5		
4. PALW consistently demonstrated a positive work attitude, including being receptive to performance feedback	1	2	3	4	5	1	2	3	4	5		
5. PALW proactively asked for assistance and guidance when needed	1	2	3	4	5	1	2	3	4	5		
6. PALW properly identified and used tools and materials	1	2	3	4	5	1	2	3	4	5		
7. PALW strengthened competency in personal safety	1	2	3	4	5	1	2	3	4	5		
8. PALW strengthened competency in work site safety	1	2	3	4	5	1	2	3	4	5		
9. PALW increased rigging and knot competency and efficiency	1	2	3	4	5	1	2	3	4	5		
10. PALW increased tailboarding competency (giving and participating)	1	2	3	4	5	1	2	3	4	5		

Source: DR 550 Attachment 1.

- The PALW must provide an honest self-assessment for each of the 10 critical core areas listed in the report
- Once completed, the PALW must review his assessment with his supervisor or crew foreman at which time the supervisor or crew foreman will provide and record his assessment of weekly performance.
- The supervisor or crew foreman will provide any specific feedback.
- The supervisor must review the weekly reports once every month (and provide his own feedback on the PALW's performance.
- Every fifth report must be completed by a supervisor.
- Both the PALW and supervisor or crew foreman will sign each weekly report.¹²⁰

23. The Pre-Apprentice Linemen program's focus on climbing skills helps to minimize the risks associated with climbing.

- One of PAL program focus areas is climbing. From 2000-2010, there were 17 falls from heights, six of which were fatalities.¹²¹
- The design of the pre-apprentice program considered the need to screen for climbing capability and delaying the opportunity to climb to minimize the risk and exposure.
 - Among other things, in order to become a PALW, a candidate must pass the Physical Pre-Employment Test, which includes climbing a pole, and lifting a cross-arm.

¹²⁰ DR 550 Attachment 1

¹²¹ DR 473 Attachment 2

- PAL candidates from within PG&E are sent to a three-day climbing school prior to reporting to the PAL program. This was implemented in May 2015 in response to a finding that pre-apprentices who enter the PAL program through the bidding process may not have climbing experience prior to attending the class, resulting in higher internal failure rates.¹²²
- There is a basic climbing module in the first eleven weeks of the pre-apprentice program.
- Pre-Apprentice Linemen are not allowed to climb until they complete the advanced climbing module in the 7th/8th month. This allows the PALs to become fully competent climbers before entering into the apprentice program.¹²³ Prior to August 2015, the advanced climbing course was in the 10th/11th month. The field employees made the case that there is value in allowing the pre-apprentices to complete advanced climbing in the seventh month and allow them to perform basic simple tasks before they become apprentices.¹²⁴
- In August 2015, PG&E benchmarked other utilities to compare process and procedures, duration, training, and testing for the PAL/AL program.¹²⁵ The following changes to the PAL program were agreed upon by PG&E Leadership and IBEW:
 - An additional day of basic climbing, and retest opportunities.
 - Completion of Advanced Climbing is based on both knowledge and skill assessments. Upon successful completion, the PAL will be allowed limited climbing with restrictions.¹²⁶

24. The Apprentice Linemen program has an adequate emphasis on safety, and has courses to help promote a robust safety culture.

- The PG&E Academy introduces safety when the apprentice program starts and continuously throughout the apprentice training. Discussion topics in the Apprentice Program include:
 - PPE
 - Tailboards
 - Stopping-the-Job if something does not look right
 - Human Performance Tools
 - Be Your Brother's Keeper.¹²⁷
- At the end of 2015/early 2016, PG&E introduced Coaching and Mentoring training for the apprentices. Its objective is to help apprentices cope with some of the

¹²² DR 473 Attachment 2

¹²³ DR 473 Attachment 2

¹²⁴ DR 473 Attachment 2

¹²⁵ DR 473

¹²⁶ DR 473 Attachment 003

¹²⁷ DR 473

pressures they may face while on a job site both immediately following the class and after becoming new Journeyman Linemen.¹²⁸

- The Coaching and Mentoring training is intended to give employees the tools needed to help create an environment where they and their crew will feel comfortable raising any safety-related issues, construction issues, or any other job-related issues without fear of reprisal or embarrassment. The training includes coaching for the apprentices on how to:
 - Provide positive and negative feedback
 - Have tough conversations to calm high-pressure crew situations
 - Motivate others
 - Take accountability
 - Improve trust in a work crew
 - Coach peers and fellow apprentices constructively
 - Achieve a safe and trusting environment
 - Use problem-solving approaches to address problems in a work environment.¹²⁹

25. Electric T&D Field Training Coordinators work with the apprentices, Academy instructors, and field supervisors to ensure that the apprentices are exposed to the work that corresponds to their training, and help to foster the safety culture by encouraging the apprentices to speak up when they see anything that is unsafe.

- The Field Training Coordinators (FTCs) program started in 2011, with the advent of the new PAL/AL program. The coordinators are experienced journeymen who serve as coach/mentor to the apprentices. The PAL/AL Team consists of a Field Training Manager, two Supervisors, and twelve Field Training Coordinators.¹³⁰
- The PAL/AL team observes PAL/AL safety habits as well as crew safety habits.
 - According to PG&E, if an observation is made where something does not look right or is unsafe, the job will be stopped to allow everyone to openly discuss the issue and come to a resolution. This is encouraged and reinforced within the PAL and AL Safety Culture training by creating an atmosphere of speaking up whenever they see anything that is unsafe.¹³¹
 - The field training coordinators sometimes serve as intermediary between the apprentice and the foreman if uncomfortable speaking up.¹³²
- FTCs are responsible for ensuring the apprentices get the experience needed, and follow-up on performance reviews from supervisors and job logs. They serve as

¹²⁸ DR 542

¹²⁹ DR 542 and DR 542 Attachment 1

¹³⁰ DR 473

¹³¹ DR 473

¹³² IR 177

advocates for the apprentices, and also recommend release from the program if necessary.¹³³

- PG&E FTCs monitor and measure apprentice performance through the following documented activities:
 - Field visits to the apprentice's job sites and headquarters (both scheduled and unscheduled).
 - Local Review Committee meetings with the apprentice's Supervisor and Union Representative.
 - Check points that must be communicated by the FTC to the apprentice's Supervisor at the end of each step in the apprenticeship program.¹³⁴

26. PG&E's analysis shows that apprentices in in the new Electric T&D program have lower OSHA recordable LWDs than linemen who did not undergo the new apprentice training. NorthStar questions the usefulness of this analysis.

- As shown in **Exhibit VIII-20**, apprentices in the new program have lower OSHA recordables and LWDs than current linemen, who did not undergo the new apprentice training.

Exhibit VIII-20
Lineman and Apprentice Lineman OSHA
Recordables and Lost Work Days

Employee Classifications	OSHA Rate	LWD Rate
2105		
Lineman and Lineman GC	7.23	1.61
Apprentice Lineman and Apprentice Lineman GC	4.17	0.00
2016 (through July 20, 2016)		
Lineman and Lineman GC	4.81	0.36
Apprentice Lineman and Apprentice Lineman GC	2.23	-

Source: DR 547 Attachment I.

- Note this is not an apples-to apples comparison as the apprentice linemen may not be performing the same work as the linemen. No apprentices have graduated to linemen yet.
- The new apprentice program started in 2011. 2016 is the first year that apprentices will graduate from the new program. Employees identified as "Apprentice Lineman" and "Apprentice Lineman GC" in **Exhibit VIII-20** are currently in new apprentice training while the majority of the "Lineman", "Lineman GC", and "Lineman Transmission" employees have not undergone the new apprentice training.

¹³³ DR 473

¹³⁴ DR 539

27. Power Generation apprenticeship programs need improvement.

- Power Generation apprenticeship programs have not been updated in several years. PG&E is currently updating its Power Generation apprenticeship programs and expects to complete the update in the first quarter of 2017.¹³⁵
- As shown in **Exhibit VIII-21**, only the Electrical Machinist apprentice program has updated guidelines. The other apprentice programs are governed by letter agreements between PG&E and IBEW from 1969 to 2002. These older guidelines refer to outdated courses and teaching methodologies.

Exhibit VIII-21 Power Generation Apprenticeship Guidelines

Apprenticeship	Document	Year
Apprentice Electrical Machinist	Guidelines for the Substation Maintenance Electric Apprenticeship Program	2011
Weather System Repairperson T200 and T300:	Letter agreement No. 92-8-PGE regarding training program for Apprentice Water Systems Repairman	1991
Hydro Operator in Training (HOIT):	Letter agreement No. R1-02-12-PGE regarding HOIT training program	2002
Electrical Machinist (Hydro):	Guidelines for apprentice electrical machinist training program	1969

Source: DR 551 Attachments 2 – 5.

- PG&E states that although most of the Power Generation apprenticeship guidelines are outdated, the programs have been modified with respect to safety. To the extent that standards and procedures have been updated to reflect new or changed safety requirements, those requirements are then incorporated into the relevant training and on-the-job requirements.¹³⁶
- The apprenticeship programs include quarterly performance reviews that are conducted between the training coordinator and the individual apprentice, with feedback from journeyman, foreman, and/or supervisors who have worked with the apprentice.¹³⁷ Among other things, apprentices are evaluated on their safety performance, attitude, and behaviors.¹³⁸ The quarterly performance reviews evaluate the following:
 - Apprentice work attitude
 - Participation in safety tailboards
 - Acceptance of performance feedback in a positive spirit
 - Requests for guidance and assistance when needed

¹³⁵ DR 682

¹³⁶ DR 682

¹³⁷ DR 682 and DR 677

¹³⁸ DR 677

- Providing support to other employees and instructors
 - Consistently attend all training opportunities
 - Practice of learned skills independently to build competency and efficiency
 - Correct interpretation and application of work procedures and standards
 - Demonstrated acquisition and retention of skills and knowledge
 - Competency in personal, worksite, and public safety
 - Working to always stay busy, be on task, and correctly finish all assigned tasks
 - Motivation to seek knowledge of craft and safety through outside sources (trade magazines, web sites, safety alerts, etc.)
 - Following directions given by supervisors and journeymen.¹³⁹
- PG&E's apprentice programs, including those for Power Generation, are being updated and approved for alignment, including a consistent review process. PG&E states that as the Power Generation apprentice programs are updated, the performance reviews will address the same or similar core attitudes and behaviors as the Electric Apprentice Lineman program.¹⁴⁰
 - Power Generation is currently implementing a baseline skills assessment program to evaluate Qualified Electrical Work/Qualified Persons' (QEW/QPs') knowledge and skills. In 2014, Power Generation began to develop Job Performance Measures (JPMs) to evaluate QEW/QPs' knowledge and skills at all stages of their careers. JPMs are "in-the-field and on-the-job" assessments, performed in actual working conditions. JPM Evaluators are usually journeyman with experience in a specific task and location.¹⁴¹
 - QEW/QPs are generally allowed unlimited attempts to pass a JPM. Efforts are considered to be training or practice sessions until the worker is ready take the JPM and can comfortably, competently, and confidently perform tasks independently. Most JPMs tied to the apprentice program allow a participant a maximum of two attempts.¹⁴²
 - There are over 80 JPMs in use or in development, ranging from battery checks and testing to the demonstration of grounding. JPMs are also included in training curricula in areas such as:
 - Pumps
 - Valves
 - Brush Maintenance
 - Power Hand Tools
 - Lathe and Milling Machines.¹⁴³

¹³⁹ DR 677

¹⁴⁰ DR 755

¹⁴¹ DR 525 and DR 676

¹⁴² DR 525

¹⁴³ DR 525 and DR 676

28. Many Power Generation employees had not completed their requisite training though October 2016. Power Generation and the Learning Academy are working to improve the timely completion of training.

- **Exhibit VIII-22** lists six courses in which over 40 percent of profiled Power Generation employees have not completed the requisite training as of October 2016.

Exhibit VIII-22

Power Generation Courses Not Completed by over 40 Percent of Profiled Employees

Course	Title	Complete	Exempted	Incomplete	Percent Incomplete as of 10/2016
EQIP-0033	Boom Truck (Fixed Cab)	27	3	40	57%
EQIP-0053	Trailer	12	2	10	42%
EQIP-0081	Crane Certification - Practical Training	14	5	45	70%
SAFE-1100	Respiratory Protection	13		27	68%
SAFE-1101	Scaffolding Safety - Authorized Person	45	1	37	45%
SAFE-1102	Scaffolding Safety - Competent Person	10	3	32	71%

Source: DR 604.

- According to PG&E, these courses had new profiles added in 2016. As a result of the addition of the profiles, this training was a new requirement for some employees. As these courses all require scheduling and specific equipment to complete the training, it will take time for all of the newly profiled employees to complete the training.¹⁴⁴
- To help improve timely completion of training in Power Generation, Power Generation and PG&E Academy are working together to ensure that training profiles for Power Generation employees are accurate and updated in a timely manner, so that employees have sufficient notice to complete the training before the deadline.
 - PG&E Academy establishes a planned schedule for all technical training classes in the fourth quarter of the prior year.
 - This schedule is reviewed throughout the year and adjustments made based on updated priorities, changing requirements, or other events (e.g., storms) that impact the ability of employees to complete previously scheduled training.¹⁴⁵
- PG&E Academy and Power Generation are also working to increase the training options to facilitate the timely completion of training requirements:
 - Local training options in which instructors travel to the employee's work location to deliver training.
 - Leader-led training in which training is cascaded down from leadership to employees (e.g., directors deliver training to superintendents; superintendents

¹⁴⁴ DR 604

¹⁴⁵ DR 678

deliver training to supervisors; and, supervisors deliver training to their employees).

- Web-based training (WBT) options to provide employees with increased access and flexibility to complete the training via computer.¹⁴⁶

29. Power Generation does not have a formal refresher training program.

- Power Generation does not have a formal refresher training program similar to Electric T&D's.
- Supervisors and superintendents in Power Generation may profile employees to leader-assigned training or request that specific training be provided to employees to update or refresh their skills. In addition, Power Generation employees are required to complete refresher training related to any profiled course that is or will expire during the year.¹⁴⁷

D. RECOMMENDATIONS

1. Accelerate crew foremen safety leadership training.
2. Profile training participants so that individuals in office-based organizations generally do not receive field-oriented safety training ahead of field organizations.
3. Complete the second 360-Degree Survey assessment for SLD program participants and compare to the first assessment results to determine the effectiveness of the training and identify any gaps to be addressed.
4. Conduct mandatory refresher training for Electric T&D, Gas Operations and Power Generation field resources on fundamental safety-related topics such as confined space, safety at heights and PPE. (See Conclusion No. 9)
5. Profile employees to receive Human Performance training.
6. Develop a monthly OQ status report for the Senior Vice President of Gas Operations and the President of Gas Operations. Include such information as number and type of examinations conducted, pass fail rates, number of qualifications expiring (in 90, 60, 30 and 5 days), the number of OQ scans conducted and the results.
7. Conduct a review of 2014 OQs to determine if contract employees were working on PG&Es system with other expired OQs. Conduct additional re-inspections as necessary.
8. Perform a feasibility study of PG&E training and testing of contractor employees for OQs. The study should consider the volume of students, the cost charged per unit, the availability of resources at PG&E and analysis of advantages and disadvantages.

¹⁴⁶ DR 678

¹⁴⁷ DR 683

9. Power Generation should continue to update its apprentice programs.
10. Power Generation should work with the Academy to improve the timeliness of training completion.
11. Power Generation should develop a refresher training program, similar to that of Electric T&D and Gas Operations.

IX: COMMUNICATIONS

This chapter provides the results of NorthStar's review of PG&E's safety-related communications to the public and employees. Public communication includes emergency-related communications and informing the public about the potential dangers associated with natural gas and electricity and PG&E's gas, electric and hydro facilities.

Employee communication is the cornerstone of PG&E's efforts to change the safety culture and drive safe behaviors. Effective employee communication fosters an engaged workforce and helps to change employee beliefs, perceptions and behaviors.

A. BACKGROUND

External Communications

PG&E's external communications include customer communications, media relations, social media and web, advertising, and emergency response. The focus of PG&E's safety-related external communications is to convey its commitment to safety, to communicate what PG&E is doing to make the system safe, and to communicate to the public how to stay safe.¹ PG&E's external channels of communication include:

- TV, radio, print advertising
- Direct mail
- Media outreach
- PGE.com
- Digital and search engines
- Currents (news blog)
- Community events
- Editorial board meetings
- Bylined articles, Op-eds and letters to the editor
- Bill inserts
- Other targeted outreach.²

Key public safety advertising, outreach and education programs include:³

- Programs focused on minimizing third-party damage to PG&E facilities which could result in a gas leak. These include the 811 Program and 811 Ambassadors – reminding customers to call 811 before they dig; the Dig-in Reduction Team (DiRT); and, the Gold Shovel Program.
- Campaigns regarding proper maintenance and repair of customer-owned gas piping.

¹ DR 004 Supplement 1, Attachment 7.

² DR 004 Supplement 1, Attachment 7, DR 018, including Attachments

³ DR 004, DR 018 and Attachments

- Campaigns regarding safety around electric facilities including the Wires Down Campaign which reminds customers to call 911 and stay away from downed power lines; metallic balloon customer education; safety around outlets; the Mind the Lines campaign reminding customers to be careful when working near power lines; 3rd Party Tree Worker Program which provides safety outreach to tree workers; and, outreach focused on the hazards associated with working in orchards near power lines and the worker's use of irrigation pipe, pole pruning, booms, and hedgers.⁴
- Preparedness and safety campaigns related to winter storms, earthquakes, summer safety, the dangers of carbon monoxide poisoning, gas leaks, and other weather conditions.⁵
- Emergency response programs: educating customers of the need to keep areas above gas transmission pipelines free of obstacles; warnings of increased water flows and potential flooding; side-by-side training with first responders; wildfire emergency response information; and, ongoing communications to public officials, first responders, and agency leads.⁶
- Hydro education public safety programs and the installation of new hydro-related public safety signs aimed at keeping people safe around dams and keeping recreational users of the waterways safe.⁷
- The Safe Kids Program that provides teachers and students with free educational materials on how to stay safe around natural gas and electricity.⁸

As shown **Exhibit IX-1**, in 2016, PG&E increased the number of safety issues it addressed in advertising campaigns in various media, including digital, radio, out of home, print, targeted outreach, and search engine marketing.⁹

Exhibit IX-1
PG&E Safety-Related Advertising
2012 to 2016

Issue	2012	2013	2014	2015	2016
Emergency Kit					✓
Wires Down	✓	✓	✓	✓	✓
Metallic Balloons				✓	✓
Gas Odor			✓		✓
811 Safe Digging	✓	✓	✓	✓	✓
Tree Safety					✓
Emergency Plan					✓
Carbon Monoxide					✓
Outlet Safety					✓

⁴ DR 004 Supplement 001 Attachment 002 and Attachment 007, DR 018

⁵ DR 004 Supplement 001 Attachment 007

⁶ DR 004 Supplement 001 Attachment 002 and Attachment 003, DR 018

⁷ DR 004 Supplement 001 Attachment 005

⁸ DR 004 Supplement 001 Attachment 002

⁹ DR 18

Issue	2012	2013	2014	2015	2016
Wires Down on Car					✓
General Safety		✓	✓	✓	
Storm Safety				✓	
Water Safety			✓		
Earthquake		✓	✓		

Source: DR 18 Attachment 1.

Internal Communications

PG&E's safety-related internal communications include, among other things, all-employee calls (town halls), periodic newsletters (i.e., Gas Matters, One PG&E and Conduit), safety meetings with leaders, all-employee emails, various LOB communications, leadership meetings, grassroots safety and incident communications. PG&E communicates to its employees via their leadership and/or direct supervisors, by email or by sending hard copy materials, which are delivered to employee work locations. Information on safety can also be found on PG&E's intranet site, accessibly by all PG&E employees through the PG&E network. While in the field, supervisors or crew leads communicate to field employees through tailboards and other in-person communications.¹⁰

PG&E's operating LOBs have several meetings which address safety issues. The cadence, audience, and focus of safety meetings varies from high level utility meetings to daily or weekly crew tailboards to daily JHAs/JSAs/JSSAs conducted at the job site.¹¹ Routine Electric T&D, Gas Operations, and Power Generation meetings are listed in **Exhibit IX-2**.

Exhibit IX-2 Recurring LOB Safety Meetings

Meeting	Frequency	Attendees	Gas	Electric T&D	Generation
Enterprise Safety and Risk Committee	Monthly	LOB Executive Management, Union Representatives	✓	✓	✓
Executive Safety Committee	Monthly	LOB Leadership	✓	✓	✓
Business Plan Review (safety component)	Monthly (LOB and company-wide)	LOB Leadership	✓	✓	✓
Daily Operations Call	Daily	LOB Leadership and staff	✓	✓	✓
LOB Risk and Compliance Committees	As determined by Chair, but no less than quarterly	LOB Leadership and Staff, Compliance and Ethics, Risk, Regulatory, and Law	✓	✓	✓
LOB Safety Councils	Monthly or every other month	LOB Leadership and staff, Grass Roots leads, and union reps	✓	✓	✓[1]
Stand Down	Ad-hoc	All employees/ contractors impacted by issue	✓	✓	✓[2]

¹⁰ DR 573

¹¹ DR 004 Supplement 001, Attachment 002

Meeting	Frequency	Attendees	Gas	Electric T&D	Generation
Worksite Tailboards / JSSA [3]	Daily/Change in Situation	All worksite employees	✓	✓	✓ [4]
Grass Roots Safety Teams	Varies	Local bargaining unit employees	✓	✓	✓ (Power Gen)
Department Standups/ Tailboards [5]	Weekly/Monthly	Ranges from specific work groups to all employees in organization	✓	✓	✓
Contractor Safety Conference Calls/ Meetings	Weekly/ Bi-Weekly/ Monthly/Quarterly	LOB leadership, inspectors, and contractors	✓	✓[6]	
Keys to Success Meetings	Monthly	Senior Gas Leadership	✓		
Electric T&D Safety	Monthly	Senior Electric Leadership		✓	
Local Safety Team Meetings	Monthly	Local employees			✓ (Power Gen)
1st and 3rd Quarter Safety meetings	Quarterly	All employees			✓ (Power Gen)
2nd and 4th quarter Safety meetings	Quarterly	All employees (local areas)			✓ (Power Gen)
Driver Awareness Team Meetings	Monthly	LOB employees			✓ (Power Gen)
Safety Culture Monitoring Panels	2-3 times a year	LOB staff			✓

Note 1: Safety leaders – union leaders and all levels of PG&E, from SVP to field grass-roots safety team leads.

Note 2: DCPD has a minimum threshold defined by station policy that will trigger a stand-down.

Note 3: JSSA reviewed at the beginning of the work shift and as any changes are made. Based on NorthStar's field observations, some field sites may conduct weekly tailboards.

Note 4: Also includes any contractors affected.

Note 5: This can involve a department, work group, or other team(s) and applies to general safety messages.

Note 6: Frequency, scope, and attendees vary by sub-LOB.

General Note: this does not include regular staff meetings of departments that implement and manage safety programs, or regular meetings between PG&E management and union leadership which often cover safety.

Source: DR 4 Supplement 1 Attachments 2, 3 and 5; DR 888.

All meetings at PG&E with three or more people are required to begin with a safety message: identifying escape paths; designating individuals to perform Cardiopulmonary Resuscitation (CPR), to call 911, to meet emergency crews, and to locate the nearest Automated External Defibrillator (AED); and what to do in the event of an active shooter or an earthquake.¹²

Measuring the Effectiveness of Communications

PG&E uses surveys to evaluate employee engagement and attitudes, including the biennial Premier Survey and the quarterly "Know/Feel/Do" survey. The survey results are intended to be used by the respective LOBs to improve employee engagement and by the PG&E organization as a whole to ensure it is moving in the right direction. Although these surveys are not specific to safety, and do not evaluate the effectiveness of individual

¹² In most cases, these were conducted during NorthStar's interviews and meetings.

communications campaigns, they do include safety-related questions and among other things, the survey results reflect the effectiveness of PG&E's safety communications.

Premier Survey

The Premier Survey is an employee opinion survey used to measure employee engagement. From 2007-2012 it was conducted annually, and is currently biennial.¹³ Results are compared to a panel of benchmark companies. The Premier Survey consists of approximately 50 questions, grouped by category, and open-ended questions designed to elicit employee comments and feedback. The Premier Survey measures many aspects of PG&E's culture. The categories of questions in the 2014 and 2016 surveys include the following:

- Engagement
- Safety
- Workforce Empowerment
- Continuous Improvement
- Work-Life Balance (2014 only)
- Alignment (2014 only)
- Customer Focus (2014 only)
- Speak Up Culture (2016 only)
- Compliance and Ethics (2016 only)
- Communication (2016 only).¹⁴

In the Premier Survey conducted in September 2016, PG&E included a new "Speak Up Culture" category to allow further insight into its safety culture. It also added a "Communication" category, but the questions in this category address the general communication of information, rather than safety-culture related items.

PG&E believes that safety culture and speak-up culture are highly interrelated. At the time of NorthStar's audit, PG&E was researching the theory that positive safety outcomes are more likely in environments with high Speak Up Culture scores (i.e., scores indicating comfort flagging problems with officers/directors, feeling safe doing what is best for safety, good ideas are adopted, it is safe to challenge the status quo, mistakes are opportunities to improve, it is safe to share thoughts and concerns with supervisors).¹⁵

The aggregate score in each survey category is made up of the results of individual questions (a question may be used in more than one category). Employees are not required to complete the survey; however, historically PG&E has had a high response rate. All submissions are anonymous. The survey is provided online, as well as on paper for field employees.¹⁶ **Exhibit IX-3** provides detailed survey results for 2016, and a comparison to 2012 and 2014 results.

¹³ DR 366 Attachment 001 and DR 726

¹⁴ DR 033 Attachment 003 and DR 662, Supplement 001 Attachment 002

¹⁵ DR 751

¹⁶ DR 004 Supplement 1, Attachment 6

Exhibit IX-3
Comparison of 2016 Premier Survey Results to 2012 and 2014

Question	2012	2014	2016
Employee Engagement Index			
1. I am willing to give extra effort to help PG&E meet its goals.	N/A	94%	93%
2. I am proud to work for PG&E.	N/A	86%	88%
3. I would recommend PG&E as a great place to work.	N/A	82%	84%
4. I am excited about the way in which my work contributes to PG&E's success.	75%	78%	76%
5. I am very confident in the future success of PG&E.	N/A	68%	70%
6. There is a sense of optimism within my work group about PG&E's future.	N/A	48%	53%
Speak Up Culture			
7. I can safely share my thoughts, concerns, and opinions with my supervisor.	82%	79%	84%
8. In my work group, we use mistakes as an opportunity to learn and improve.	N/A	N/A	83%
9. I feel safe at work to do or say what I think is best for PG&E.	N/A	N/A	77%
10. Employees at PG&E feel comfortable flagging problems to Officers and Directors.	N/A	N/A	57%
11. Conditions at PG&E make it safe to challenge the status quo.	N/A	N/A	56%
12. Good ideas are adopted at PG&E regardless of who suggest them.	N/A	47%	55%
Safety			
13. My work group follows safe work practices without taking short cuts.	N/A	N/A	93%
14. I feel free to stop my work if I believe conditions are unsafe.	N/A	N/A	93%
15. I feel comfortable discussion safety issues with my supervisor.	N/A	91%	93%
16. My supervisor insists that safety rules are carefully followed even if it means that work is slowed down.	N/A	N/A	89%
17. My supervisor acts quickly to correct safety issues.	N/A	87%	87%
18. Officers and Directors demonstrate through their actions that safety is a top priority at PG&E.	N/A		79%
19. People in my work group report injuries and incidents, no matter how minor.	N/A	71%	74%
20. The near hit incidents that occur in my work group are reported to my supervisor.	73%	N/A	74%
Compliance and Ethics			
21. I understand PG&E's Code of Conduct.	N/A	N/A	96%
22. I am aware of how to report ethical concerns or observed misconduct at PG&E.	N/A	N/A	92%
23. Unethical behavior is not tolerated in my work group.	N/A	N/A	86%
24. Acting ethically and with integrity in my work group takes priority over achieving business results.	78%	79%	81%
I feel safe at work to do or say what I think is best for PG&E. (See Q 9)	N/A	N/A	77%
25. I can report unethical behavior or practices without fear of retaliation at PG&E.	N/A	N/A	75%
26. PG&E responds quickly and consistently to verified or proven unethical behavior.	N/A	N/A	65%
Employees at PG&E feel comfortable flagging problems to Officers and Directors. (See Q 10)	N/A	N/A	57%

Question	2012	2014	2016
Conditions at PG&E make it safe to challenge the status quo. (See Q 11)	N/A	N/A	56%
Communication			
27. My supervisor communicates useful information to employees.	72%	61%	83%
28. I have enough information to do my job well.	N/A		75%
29. PG&E has tools in place that enable employees to easily share information.	N/A	68%	66%
30. How satisfied are you with the information you receive from management on what's going on at PG&E?	N/A	59%	60%
31. Officers and Directors provide a clear direction for PG&E.	N/A	N/A	58%
Continuous Improvement			
32. The people I work with cooperate to get the job done.	83%	84%	86%
33. My work group values diverse perspectives.	75%	75%	78%
34. I have the authority to make decisions that improve the quality of my work.	N/A	66%	74%
35. Roles and responsibilities within my work group are clear.	N/A	72%	72%
36. Work is prioritized effectively within my work group.	N/A	59%	65%
37. Officers and Directors actively support applying best practices across different areas of the business.	N/A	51%	59%
38. I see people in different departments and groups collaborating with one another.	N/A	62%	57%
Good ideas are adopted at PG&E regardless of who suggests them. (See Q 12)	N/A	47%	55%
39. Processes in my work group are well-organized and efficient.	N/A	49%	49%
40. In response to the last Premier Survey in 2014, changes were made in my work group that resulted in meaningful improvement.	N/A	34%	32%
Workforce Empowerment			
I feel comfortable discussing safety issues with my supervisor. (See Q 15)	N/A	91%	93%
I can safely share my thoughts, concerns and opinions with my supervisor. (See Q 7)	82%	79%	84%
My work group values diverse perspectives. (See Q 33)	75%	75%	78%
I have the authority to make decisions that improve the quality of my work. (See Q 34)	N/A	66%	74%
41. I can respond to problems without seeking approvals.	N/A	62%	67%
42. How satisfied are you with your involvement in decisions that affect your work?	N/A	57%	60%
Good ideas are adopted at PG&E regardless of who suggests them. (See Q 12)	N/A	47%	55%

Note: Orange shading indicates the same question is used in more than one Category.

Source: DR 662, Attachment 001 and DR 662 Supplement 001, Attachment 002.

PG&E uses the Premier Survey results, including the comments, as a tool to help leaders identify areas that need improvement. All PG&E officers and directors are expected to develop action plans to address areas where their organization did not perform as well as desired.¹⁷ These action plans may be at the director level, or, if appropriate, at the manager or supervisor level.¹⁸

¹⁷ DR 716

¹⁸ DR 751

The 2016 Premier Survey results for LOBs which are the focus of NorthStar's study are provided in **Exhibit IX-4**. As shown in the exhibit, in 2016, Engagement and Speak Up Culture results varied significantly between LOBs. Grey shading indicates areas where the LOB is below the PG&E enterprise average.

Exhibit IX-4
2016 Premier Survey Results – Selected LOBs [Note 1]

Survey Index	Highest Score/LOB		Lowest Score/LOB		PG&E Enterprise	Gen.	Elec T&D	Gas Ops	S&SS
Engagement	88%	Ethics & Comp.	69%	Energy Policy & Proc.	77%	70%	74%	81%	76%
Speak Up Culture	82%	Ethics & Comp.	64%	ET&D/ Gen Counsel	69%	73%	64%	70%	65%
Safety	90%	Ethics & Comp./ Cust. Care	76%	Gen Counsel	85%	88%	83%	83%	85%
Compliance and Ethics	90%	Ethics & Comp.	72%	ET&D	76%	80%	72%	76%	73%
Communication	77%	External Affairs & Public Policy	63%	ET&D	68%	68%	63%	69%	66%
Continuous Improvement	73%	Finance	58%	ET&D	63%	62%	58%	63%	59%
Workforce Empowerment	85%	Ethics & Comp.	70%	ET&D	73%	72%	70%	73%	72%

Note 1: Grey shading indicates areas where the LOB is below the PG&E enterprise average.

Source: DR 662 Attachment 1 and DR 662, Supplement 001, Attachment 002.

Know/Feel/Do Survey

In early 2013, the Senior Officers identified important alignment and culture-shaping goals, asking: "In a PG&E culture that's capable of delivering business results while supporting our long-term reputational interests, what do all PG&E employees *know*, *feel*, and *do*?" The exercise produced 16 answers. The quarterly Know/Feel/Do® survey assesses the progress PG&E is making in shaping culture and aligning the organization in support of performance.¹⁹

According to PG&E, the primary drivers for the Know/Feel/Do scores are as shown in **Exhibit IX-5**:

¹⁹ DR 444 Attachment 1

Exhibit IX-5 Know/Feel/Do Score Drivers

Survey Category	What Moves Scores? (per PG&E)
Know	Messages sent to employees through formal and informal communications.
Feel	Leaders' decisions and actions, including what gets rewarded and what gets tolerated. Formal and informal communication channels play a supporting role in reinforcing and amplifying messages.
Do	The messages sent through both words and actions influence PG&E employees' behavior.

Source: DR 444 Attachment 1.

PG&E considers the following questions in the Know/Feel/Do survey to have a relationship to safety culture:

- I *know* what we're doing to improve safety, reliability, and affordability.
- I *feel* the way we operate shows that nothing is more important than public and employee safety.
- I *feel* I can raise safety, security, compliance, or other issues without peer pressure or fear of reprisal.
- I *feel* I can speak up, innovate, solve problems, and make positive changes.
- Employees in my area *speak up* when they see something wrong or have a good idea, regardless of chain of command.
- Employees in my area *do* their work using proper methods and procedures – with no tolerance for cutting corners.²⁰

Monitor 360 Study

In 2014, PG&E's external consultant, Monitor 360, reviewed employee comments, primarily from the 2012 and 2014 Premier surveys to identify "narratives" that indicate opportunities to improve PG&E's safety culture. PG&E used these narratives as a starting point for the development of a safety communication campaign ultimately rolled out in Fall 2016.²¹

Monitor 360 analyzed the survey comments using software algorithms which plots the comments into themes based on content similarity and then consolidates the themes into organizational narratives. As explained by Monitor 360 in its January 2015 report, "organizational narratives are the stories that capture employee mindsets and reflect an organization's culture. They are a lens through which employees interpret communication and action from leaders and peers and help to explain why PG&E employees hold the attitudes and beliefs uncovered in Premier Survey findings."²²

Monitor 360 classified the narratives as Enterprise and/or Safety. As summarized in **Exhibit IX-6**, both Enterprise and Safety narratives were clustered in three areas. Although

²⁰ DR 366

²¹ DR 256

²² DR 256 Attachment 1

the Premier Surveys specifically asked participants to comment on areas of improvement, some comments still told positive stories about company progress.

Exhibit IX-6
Overview of Monitor 360 Narrative Analysis Results

Narrative Theme	Enterprise Narratives		Safety Narratives	
	Why?	% of Comments	Why?	% of Comments
Company Progress Positive stories about PG&E's mission, impact on customers, direction, and development opportunities	<ul style="list-style-type: none"> • Proud to be PG&E • Renewed Commitment to Safety 	14%	<ul style="list-style-type: none"> ▪ Safety First ▪ On the Right Path 	29%
Structural Obstacles Stories about structures and processes that are getting in employees' way and causing frustration	<ul style="list-style-type: none"> • Climbing Ladders but not Poles • Unprepared for the Future • Frozen Middle 	40%	<ul style="list-style-type: none"> ▪ Lost in Middle Management ▪ Safety is a Burden 	40%
Cultural Disconnect Stories about leadership-workforce misalignment, and employee anger at PG&E's changing culture	<ul style="list-style-type: none"> • Talk is Cheap • Productivity Over People • Losing Sight of the Customer; PG&E Used to be a Family 	46%	<ul style="list-style-type: none"> ▪ Profit is King ▪ Productivity Over Safety ▪ Keep Quiet, Keep Working 	31%

Source: DR 256 Attachment 1.

The impacts of specific narratives on employee's perception of the PG&E Enterprise and Safety shifted from 2012 to 2014 as summarized in **Exhibit IX-7**.

Exhibit IX-7
Monitor 360 Analysis
Changes in Narrative Impact from 2012 to 2014

Narrative	Share of Impact 2012	Share of Impact 2014	Direction of Change in Impact*	Significant Change
Enterprise Narratives				
Company Progress	11%	14%	+3	
Proud to be PG&E	11%	9%	-2	
Renewed Commitment to Safety	N/A	5%	+5	✓ (positive)
Structural Obstacles	40%	40%	--	
Climbing Ladders, But not Poles	18%	15%	-3	
Unprepared for the Future	12%	13%	+1	
Frozen Middle	10%	12%	+2	

Narrative	Share of Impact 2012	Share of Impact 2014	Direction of Change in Impact*	Significant Change
Cultural Disconnect	49%	46%	-3	
Talk is Cheap	11%	12%	+1	
Productivity Over People	19%	12%	-7	✓ (positive)
PG&E Used to Be a Family	10%	12%	+2	
Losing Sight of the Customer	9%	10%	+1	
Total	100%	100%		
Safety Narratives				
Company Progress	27%	29%	+2%	
Safety First	13%	15%	+2	
On the Right Path	14%	14%	0	
Structural Obstacles	19%	31%	+12%	
Lost in Middle Management	8%	17%	+9	✓ (negative)
Safety is a Burden	11%	14%	+3	✓ (negative)
Cultural Disconnect	54%	40%	-14%	
Profit is King	30%	21%	-9	✓ (positive)
Productivity Over Safety	22%	16%	-6	✓ (positive)
Keep Quiet, Keep Working	2%	3%	+1	
Total	100%	100%		

Source: DR 256 Attachment 1.

Exhibit IX-9 and **Exhibit IX-10** (pages following) present further information regarding areas in which Monitor 360 identified significant positive and negative shifts in narratives between 2012 and 2014.

PG&E Analysis of 2016 Premier Survey Responses

PG&E performed a similar analysis of comments in the 2016 Premier Survey responses to understand themes from three open-ended questions:

- What specific suggestions do you have to help make PG&E a better place to work?
- As an employee, how do you feel that PG&E has changed in the last 2 years?
- What is the most important reason you continue to work for PG&E?

Similar to Monitor 360, PG&E rolled the comments into three overall themes: 1) Company progress, 2) structural obstacles and 3) cultural divide. As shown in **Exhibit IX-8**, the analysis showed no change in the percentage of comments that addressed three narratives related to safety culture.

Exhibit IX-8 PG&E Analysis – 2016 Premier Survey Narrative Themes

Narrative	Illustrative Quotes	2012	2014	2016
Company Progress				
Renewed Commitment to Safety	“Safety is definitely PG&E's number one priority. Nothing challenges that. Safety permeates everything.”	N/A	5%	5%
Cultural Divide				
Let's Walk the Talk	“A fear of retaliation is very real... Decisive, visible steps need to be taken when employees have the courage to speak up.”	11%	12%	12%

Narrative	Illustrative Quotes	2012	2014	2016
Structural Obstacles				
Climbing Ladders but not Poles	“Maybe the safety leadership should consist of people that have some knowledge of the work, tools used, and equipment used to perform the work. It seems the safety leaders are more focused on creating a paper trail.”	18%	15%	15%

Source: DR 662 Supplement 1 Attachment 1.

Exhibit IX-9
Monitor 360 Narratives in Areas that Showed Significant Improvements between 2012 and 2014

Summary of Issue	Relevant 2014 Premier Survey Results	Monitor 360 Narrative
Enterprise Narrative		
Renewed Commitment to Safety was created in 2014, reflecting successful leadership investments and engagement in improving safety culture.	<ul style="list-style-type: none"> • Feel comfortable discussing safety issues with my supervisor – 91% • My supervisor acts quickly to correct safety issues – 87% 	Nothing is more important than safety at PG&E today. For too long, we had a culture of complacency and general acceptance of unsafe behavior. But in the past few years—especially since San Bruno—I can honestly say that this is a company that takes safety seriously. And it's a change that is being driven from the top of the organization. I am confident that leadership is taking safety seriously and treating it as our #1 priority. No matter what department or group you're in, keeping yourself and the customers safe is the priority. The company invests a lot of resources into training and tools, even ergonomics, to make sure that PG&E remains a healthy and safety-oriented environment. I'm proud of PG&E's commitment to keeping its employees and its customers safe.
Productivity over People declined strongly across all operational units, as perceptions that leadership values metrics over employee well-being diminished.	<ul style="list-style-type: none"> • Work-life balance – 63% • Feel satisfied with recognition received for good work – 56% • Good ideas are adopted at PG&E regardless of who suggests them – 47% 	<p>Management's obsession with metrics has created the wrong incentives at PG&E. Looking good on paper is the only way to move up, and we are all becoming bean counters, more focused on meeting narrow targets than supporting broader company goals. Even crew foremen are wasting their time reporting on what they are doing rather than actually completing their work, and support for our most important resource—our people—has fallen to the wayside. Supervisors and managers are so concerned with impressing their bosses on paper that they forget to acknowledge the hard work we're doing on the front lines— even as they push us to work more and more overtime and sacrifice our work-life balance.</p> <p>Morale is at an all-time low, and talented people are starting to move on to greener pastures. To stop the attrition, we need to end the obsession with misleading metrics and lagging indicators, and remember that a pat on the back can go a long way.</p>

Summary of Issue	Relevant 2014 Premier Survey Results	Monitor 360 Narrative
Safety Narrative		
Profit is King declined substantially, as broad-scale engagement of employees in safety culture helped to counter deeply cynical perceptions of leadership intentions and values	<ul style="list-style-type: none"> • Feel satisfied with information from senior management – 59% • There is a sense of optimism within my work group about PG&E's future – 48% • In response to 2012 Survey, changes were made in my work-group that resulted in meaningful improvements – 34% 	Leadership may say that safety comes first, but if it requires spending money, they don't walk the talk. From hiring untrained contractors who cut corners on safety to eliminating the small gift cards that used to be a form of recognition for doing work safely, upper management has demonstrated that all they really care about is the bottom line. There shouldn't be a struggle every time I try to get money approved for legitimate safety reasons. We need more resources, not less, to invest in training and other programs, and to ensure that we embrace the safety culture we supposedly stand for. You'd think the company would have changed its ways given what we've been through. The way things are going, we're bound to repeat past mistakes.
Productivity over Safety declined substantially, as leadership worked to streamline seemingly conflicting messages and emphasize the importance of safety above other priorities	<ul style="list-style-type: none"> • People in my work group report all injuries and incidents, no matter how minor – 71% • Work-life balance – 63% • Feel satisfied with recognition received for good work – 56% 	The pressure to do more with less—and do it faster—is compromising this company's safety culture. I do my best to follow safety procedures in the field, but I can't do right by myself or my customers when I don't have enough time or manpower. Management thinks that working faster with smaller crews better serves the customer, but it's just not sustainable. It's painful to see understaffed, poorly equipped, burned out crews being asked to put in extra overtime when they can barely keep their eyes open to drive. Because we care about our customers and this company, we're willing to go the extra mile. But when we're rushed and shorthanded, we increase the risk of mistakes and safety issues. To continue to serve our customers and to do it safely and efficiently, we need to reinvest in our workforce—better equipment, training, and fully staffed crews.

Source: DR 256 Attachment I.

Exhibit IX-10
Monitor 360 Narratives in Areas that Worsened between 2012 and 2014

Summary of Issue	Relevant 2014 Premier Survey Results	Monitor 360 Narrative
Safety Narrative		
Lost in Middle Management increased substantially across roles and LOBs, as a series of new initiatives created widespread confusion around processes and priorities	<ul style="list-style-type: none"> • Role and responsibilities within my work group are clear – 72% • I see people in different departments and groups collaborating – 62% • Senior management supports best practices across multiple areas of business – 51% 	I believe that leadership is genuinely committed to safety. But layers upon layers of middle management have created widespread confusion around roles and responsibilities, watering down leadership's commitment to putting "safety first." Lines of business have become silo-ed and are not cooperating enough, resulting in divergent safety procedures. On top of that, too many supervisors lack the experience and knowledge to keep the public and their employees safe. Somewhere in the bureaucratic middle, the commitment to safety is getting lost. Until leadership overcomes PG&E's bloated middle management and empowers experienced employees in the field, we'll never meet our commitment to safety.
Safety is a Burden increased, reflecting frustration with new policies that generate paperwork and change or systematize longstanding processes	<ul style="list-style-type: none"> • Efficiency – 60% • Work is prioritized effectively in my work group – 59% • Processes are well-organized and efficient in my work group – 49% 	The focus on safety has become a burden. At this point, it's out of control. We're drowning in complicated rules, checks, and procedures that are constantly changing. Enough! The push to make people more comfortable with reporting near misses was good, but now every minor accident gets blown out of proportion. We're creating new and unnecessary rules that burden everyone—including those working safely. As a result, we're driving compliance, not safety, in the field. We don't need more tailboards, safety messages at the start of every meeting, and safety flashes flooding our inboxes. Let's simplify the processes to focus on real priorities and get back to using common sense.

Source: DR 256 Attachment 1.

B. EVALUATIVE CRITERIA

- Are safety values communicated and carried out vertically within the Company?
- Does PG&E have a comprehensive plan to communicate the safety culture message to employees in a manner that they understand and accept the message? Has the type and amount of employee communication on safety culture initiatives and programs hit a saturation point? Are employees hearing and accepting the safety messages?
- Has union support and communications contributed to employee understanding and involvement in safety culture?
- Does PG&E adequately measure and evaluate the effectiveness of employee communications and, as appropriate, make the necessary timely improvements?
- Does PG&E have a comprehensive plan to communicate with customers in case of emergency issues that could impact them directly? Are specific public safety concerns adequately and effectively communicated to the public?

C. FINDINGS & CONCLUSIONS

1. As one of the first steps towards its new safety culture, PG&E appropriately developed documented “Safety Principles” and “Keys to Life” which defined the new culture and explained acceptable behavior.

- PG&E developed two cornerstones of its new safety culture, “Safety Principles” and “Keys to Life.”²³ These were primarily presented in the Safety Leadership Workshops which were held from 2012 to 2014. About 4,700 employees from crew foreman to the CEO attended these workshops.
- NorthStar cannot confirm whether the Safety Principles were provided to all employees or provided prior to 2012-2014.
- The Safety Principles are shown in **Exhibit IX-11**. As explained by PG&E they “are the foundation of our new approach to safety.”²⁴

²³ DR 568

²⁴ DR 25 Attachment 5

Exhibit IX-11 Safety Principles

SAFETY PRINCIPLES

- Nothing is more important than public and employee safety.
- We must create an environment at PG&E where employees feel that they can raise all safety-related issues without peer pressure or fear of reprisal. This includes near hits and unsafe situations of any kind.
- We encourage open and honest communication on safety, so that we identify and eliminate unsafe situations and avoid incidents and injuries.
- To enhance safety and prevent future incidents, we will adopt a voluntary, non-punitive self-reporting system for unsafe occurrences and hazardous situations.
- We acknowledge and reward safe behavior and practices to encourage our employees and to reinforce continuous learning.
- Safety discussions are used as an opportunity for learning and coaching. When an incident occurs, our first priority is to understand what happened and the underlying causes, not to discipline.
- We will adopt a behavior-based approach to discipline. Discipline will only be considered when employees act in a reckless manner; demonstrate a pattern of carelessness or noncompliance; or put themselves, their co-workers or the public at risk by intentionally violating the Keys to Life or Code of Conduct.

Source: DR 25 Attachment 004.

- The “Keys to Life,” shown in **Exhibit IX-12**, replaced the “Rules to Live By.” According to PG&E the title change reflects the change in emphasis in how we lead, how we communicate, and why these are here – bottom line to protect us – our employees, our contractors and our public.²⁵ They are an example of the changes being made to shift from a rules-based approach to safety to one where employees take responsibility for their personal safety.²⁶
- During the course of its review, NorthStar found little mention of the Keys to Life.

²⁵ DR 25 Attachment 7

²⁶ DR 768 Attachment 1

Exhibit IX-12 Keys to Life

KEYS to LIFE

To assure your safety and that of your co-workers and the public:

- Follow safe driving principles.
- Use appropriate, life-saving PPE.
- Follow electrical safety testing and grounding rules.
- Follow clearance and energy lock out rules.
- Follow confined space rules.
- Follow suspended load rules.
- Follow safety at heights rules.
- Follow excavation procedures.
- Follow hazardous environment procedures.

Source: DR 148 Attachment 1.

2. PG&E's primary method of communicating its post-San Bruno approach to safety was through the Safety Leadership Workshops in 2012 to 2014, and leaders' follow-up discussions with employees. There are pitfalls to this approach, as information is only as good as the managers delivering the message. Moreover, there was no direct communication to LOB field personnel.

- As discussed in **Chapter VIII: Recruiting and Training**, the Safety Leadership Workshops set the stage for substantial changes in safety management and safety culture. All Crew Foreman, Supervisors, Managers, Directors and Executives completed these full-day workshops.
- There was no formal company-wide communication campaign for the Safety Principles and Keys to Life.²⁷ They were first introduced and communicated at the Safety Leadership Workshops. The leaders who attended these workshops, from crew foremen to executives, then communicated this information to employees in their preferred manner.²⁸
- In August 2013, the SVP Safety & Shared Services sent an email to the PG&E Extended Leadership Team stressing the need for them to have constructive conversations about safety.

“Nearly every leader throughout our company has participated in a Safety Leadership Workshop. The expectation is that you are now meeting with your teams to share how our Safety Principles, Safety Commitments, Keys to Life and taking a different approach to discipline will support our efforts.”

²⁷ DR 568

²⁸ DR 568

He also included an update on key safety initiatives, and a discussion guide to help have safety conversations with employees.²⁹

- A few months later, in October 2013, the SVP Safety & Shared Services sent a safety video to Safety Leaders, asking them have a face-to-face meeting with their team members to discuss what can be done to improve work place safety, noting “[h]olding frequent, meaningful conversations with your teams is something we asked of you in the Safety Leadership Workshops. Now is a good time to follow up, reinforce that nothing is more important than public and employee safety, and address any risks that could result in incidents...”³⁰
- While effective communication from management to staff is key to providing safety leadership, and face-to-face communication has great impact, the communication of the message is only as good as the messenger. It is possible that some leaders do not convey the safety message adequately, or with sufficient conviction.
- Leaders continue to have a defined role in communicating PG&E safety culture to their teams.
 - As discussed in **Chapter VIII: - Recruiting and Training**, each of the six Senior Leadership Development workshops had specific actions for the participants to work on with their direct-reports.³¹
 - Much of PG&E’s communication strategy relies on “cascaded communications.” (See Conclusion 5)

3. There was limited company-wide communication regarding PG&E’s overall safety culture strategy. NorthStar’s review found that company-wide email communications regarding safety culture did not begin until early 2012 and there has been no email communication regarding a company-wide update on the Safety Culture Roadmap since 2014.

- NorthStar’s review of email communications from the CEO, Presidents, and other PG&E Officers and Executives found only a few company-wide emails describing PG&E’s efforts to improve its safety culture. These emails are listed in **Exhibit IX-13**.

²⁹ DR 66 Attachment 79

³⁰ DR 66 Attachment 64

³¹ DR 290 Attachment 51

Exhibit IX-13
Officer and Executive Emails to All Employees Regarding Safety Culture Change

Date	Sender(s)	Description/Key Points
2/14/2012	Chairman & CEO and President	Kicking Off Safety 2012 <ul style="list-style-type: none"> • In the past year and a half, it's grown evident that we must address a number of gaps in our programs, processes and culture. • In the weeks and months ahead, you'll see and hear more about the ways we are strengthening our approach to safety. • Introduced Chairman's Safety Review Committee.
3/29/2013	SVP S&SS	Safety Culture Change: Building Momentum <ul style="list-style-type: none"> • Over the past year, teams across the company have been working to improve processes and drive initiatives that encourage and enable employees to speak up about safety issues. • Near-Hit Reporting • Grassroots Safety Teams • Safety Leadership
3/13/2014	President and SVP S&SS	Safety Culture Assessment: Listening and Taking Action <ul style="list-style-type: none"> • Results of first comprehensive study of PG&E's safety culture. • What we learned • Where we go from here • "We are listening to you and taking action to create a multi-year roadmap"
6/2/2014	SVP S&SS	Safety Changes and Progress We Made <ul style="list-style-type: none"> • New Safety Health and Environment Organization. • New Safety Committee Structure • Safety Culture Roadmap – Leadership training and SIFs • "Our journey to create and maintain a strong safety culture will never stop... We'll continue to provide regular updates on our progress..."

Source: DR 66 Attachments 56, 57, 64, and 79; DR Supplement 1 Attachment 5.

- In addition to emails regarding the new safety culture, many Officer and Executive safety-related emails addressed specific safety initiatives, updates on post-San Bruno activities, specific safety incidents, or safety guidance (mostly related to driving).³²

4. Although not part of a specific or unified campaign, the overarching message PG&E has been striving to instill in its workforce is that nothing is more important than safety and employees should "speak-up" where safety is concerned. NorthStar's interviews and direct observations, as well as PG&E's survey results indicate that PG&E has made significant strides in this area; however, this belief is not yet firmly and sustainably entrenched within the organization.

- "Nothing is more important than public and employee safety" is the first statement in PG&E's Safety Principles. While it is not a slogan used in formal communications campaign, PG&E has used this phrase or a similar phrase in company-wide email communications dating back to at least 2013.³³

³² DR 66 and DR 66 Supplement 1 and all attachments

³³ DR 259

- NorthStar attended the Second Annual Safety Summit for Officers and Directors.³⁴ As part of summit, participants were asked to complete a self-assessment of their safety leadership. Aggregated results were presented at the meeting and indicated that improvement is still required. NorthStar also observed varying levels of comfort among the Officers and Directors in speaking up in response to questions posed by the facilitator.
- As shown in **Exhibit IX-14**, PG&E's 2016 Premier Survey overall result for safety was 85 percent, and there was moderate improvement in areas that were analyzed in previous years. PG&E hypothesizes that there is a Speak Up Culture "anchor" which impacts the lower, 74 percent, outcomes.³⁵

Exhibit IX-14
2016 Premier Survey Safety Index Results

Category/Item	PG&E 2016	US Utilities Plus Benchmark	PG&E 2014
Overall Safety Index	85%		
My work group follows safe work practices without taking short cuts.	93%	76%	
I feel free to stop my work if I believe conditions are unsafe.	93%	75%	
I feel comfortable discussing safety issues with my supervisor.	93%	-	91%
My supervisor insists that safety rules are carefully followed even if it means that work is slowed down.	89%	65%	
My supervisor acts quickly to correct safety issues.	87%	-	87%
Officers and Directors demonstrate through their actions that safety is a top priority at PG&E.	79%	67%	
People in my work group report injuries and incidents, no matter how minor.	74%	-	71%
The near-hit incidents that occur in my work group are reported to my supervisor.	74%	-	73% (2012)

Note 1: The Utilities Plus benchmark is customized for PG&E and includes utilities and natural resource companies with high union ratios, safety focus and 24/7 operations. NorthStar has not reviewed the benchmark.

Source: DR 662 Supplement1 Attachment 2.

- The results of 2016 Premier Survey Speak-Up Culture Index questions are shown in **Exhibit IX-15**. The 2016 Premier Survey identified three opportunities for improvement relating to Speak-Up Culture:
 - Comfort in flagging problems to Officers and Directors.
 - Feeling safe to challenge the status quo.
 - Believing good ideas are adopted, regardless of who suggests them.³⁶

³⁴ IR 185

³⁵ DR 662 Supplement 1 Attachment 2

³⁶ DR 751

Exhibit IX-15
2016 Premier Survey Speak-Up Culture Index Results

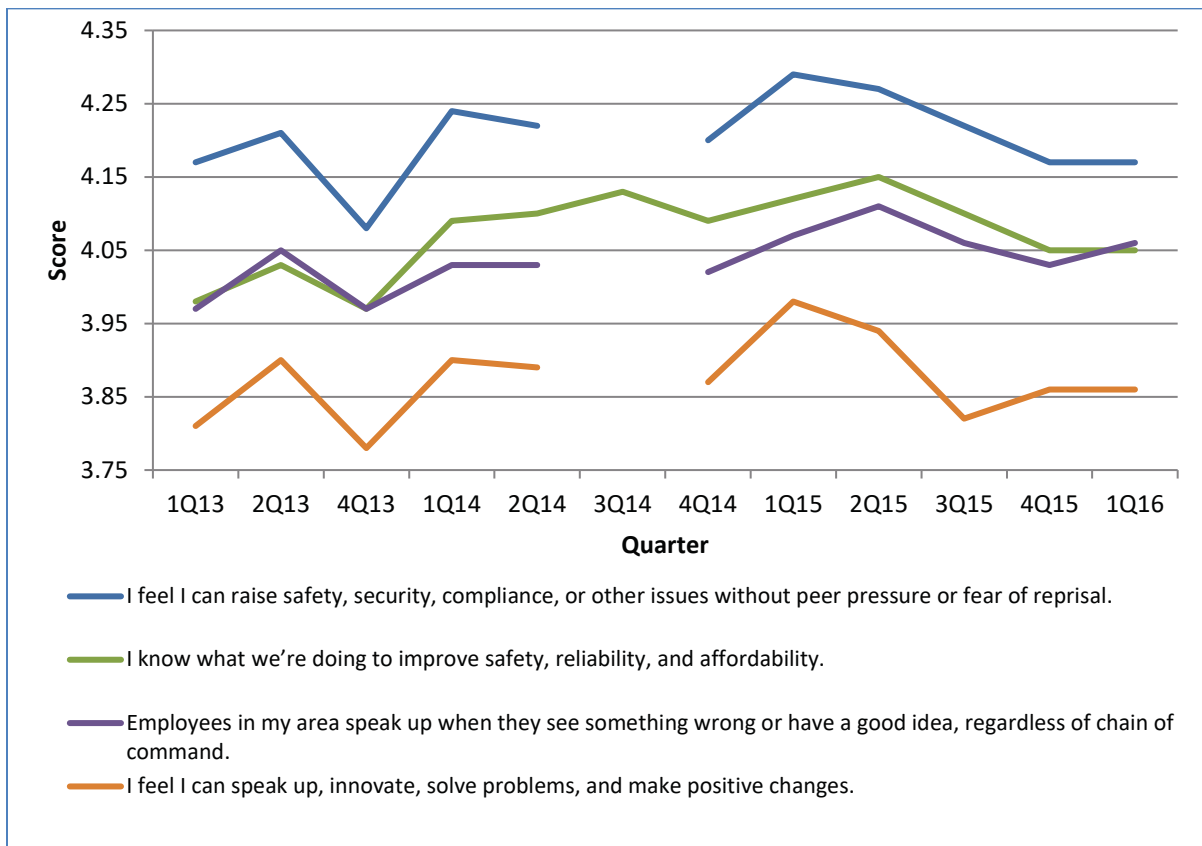
Category/Item	PG&E 2016	US Utilities Plus Benchmark	PG&E 2014
Overall Speak-Up Index	69%		
I can safely share my thoughts, concerns, and opinions with my supervisor.	84%	NA	79%
In my work group, we use mistakes as an opportunity to learn and improve.	83%	67%	
I feel safe at work to do or say what I think is best for PG&E.	77%	68%	
Employees at PG&E feel comfortable flagging problems to Officers and Directors.	57%	-	
Conditions at PG&E make it safe to challenge the status quo.	56%	50%	
Good ideas are adopted at PG&E regardless of who suggests them.	55%	56%	47%

Note 1: The Utilities Plus benchmark is customized for PG&E and includes utilities and natural resource companies with high union ratios, safety focus and 24/7 operations. NorthStar has not reviewed the benchmark.

Source: DR 662 Supplement1 Attachment 2.

- The Know/Feel/Do survey results related to Speak-Up culture and employee knowledge of what PG&E is doing to improve safety, reliability and affordability are shown in **Exhibit IX-16**.
 - The scores in all areas peaked in the first two quarters of 2015, and have declined since.
 - Although it generally has the highest score of all safety-related questions, it is concerning that the 1Q16 score is the same as the 1Q13 score for the statement “I feel I can raise safety, security, compliance or other issues without peer pressure or fear of reprisal.”
 - For the most part, there has been a slight increase in scores between 1Q13 and 1Q16.

Exhibit IX-16
Know/Feel/Do Safety Culture-Related Questions
Enterprise-Wide Results



Note: According to PG&E, there are no survey responses for “Feel and Do”- related questions third quarter 2014 because the PG&E’s Premier Survey was being conducted at the same time. The questions listed above are those that PG&E considers to be safety-related.

Source: DR 30, Attachment 1 and NorthStar analysis, DR 366.

5. Safety-related values are communicated vertically within the Company, largely on an LOB-specific basis using a variety of formats. NorthStar’s review of PG&E’s communication materials and the 2014 Monitor 360 report found that PG&E is overwhelming its employees with safety-related communications.

- PG&E routinely updates its employees on emerging issues, trends, safety incidents and new safety programs through a variety of media in addition to the meetings listed in **Exhibit IX-2**.
 - Phone Calls
 - Department calls.³⁷
 - “All hands” company-wide calls.³⁸
 - Emails and Printed Material

³⁷ DR 452

³⁸ DR 452

- Hazard specific bulletins.³⁹
 - Safety Flashes – A “flash” may be created and sent to all field leadership to be further distributed to the field during tailboard discussions in order to direct employees’ attention to a critical tool/method, or to share an event.⁴⁰
 - Print publications such as the One PG&E (distributed to all employees) and Gas Matters newsletters (distributed to all Gas employees).⁴¹
 - ELT Roundup – An electronic newsletter sent to Extended Leadership Team (ELT).⁴²
 - Tailboards and 5 Minute meetings delivered by supervisors or another employee.⁴³
 - “Road shows” (multiple field site visits) to share progress and solicit feedback.⁴⁴
 - Communication campaigns such as the Speak Up for Safety campaign.⁴⁵
- Safety Culture communications come from numerous sources, and there is no overall control of the amount or content of the safety-related communication. The structure, content and clarity of (and likely the effectiveness of) communications varies considerably by LOB and author.⁴⁶
 - The Monitor 360 analysis of 2012 and 2014 survey results found that PG&E was overwhelming its employees with email traffic, such as safety flashes, near misses, and tailboards. The Monitor 360 report included the following illustrative survey comments as part of its discussion of the narrative that “safety is a burden.”
 - “It seems that it has gone overboard with a lot of the smaller stuff to bring awareness to the masses. My emails are flooded with safety flashes, near misses, and tailboards. So much so, that I just glaze over most of it now...”
 - “I KNOW...I KNOW...it’s extremely important!!!! but please it doesn't have to be everywhere...it’s to a point where the message isn't effective anymore because it’s shoved down everyone’s throat almost every minute...how many time have I heard the “LADDER safety” message. Enough...its overkill.”⁴⁷
 - NorthStar’s interviews and field visits confirm that some employees disregard information as it may not pertain to them, or in light of the volume of information received.
 - PG&E’s Corporate Safety webpage has quarterly lists of tailboards available for supervisors’ use. Use of these tailboards is not a requirement; supervisors may substitute other tailboards that they feel are applicable to their work groups or relevant

³⁹ DR 452

⁴⁰ DR 452 and DR 150

⁴¹ DR 746

⁴² DR 531 Attachment 2

⁴³ DR 746

⁴⁴ DR 452

⁴⁵ DR 746

⁴⁶ Review of safety-related communications (various DRs).

⁴⁷ DR 256 Attachment 1

for recent events.⁴⁸ NorthStar’s review of the 54 tailboards on the Corporate Safety website found:

- Tailboards generally have an attendance sheet; 5 minute meetings do not.
 - 8 of the tailboards were actually “5 minute meetings” which pertained to Information Technology issues, and were not directly safety-related.
 - Tailboards addressed office safety (e.g., commuter safety, tendonitis), site safety (e.g., chainsaws, dealing with dogs), and wellness/off the job safety (e.g., hunting, holiday alcohol).⁴⁹
- The operational LOBs also develop tailboards that are not on PG&E’s Corporate Safety webpage.⁵⁰

6. Although PG&E states that the 2016 Speak Up for Safety campaign was created in response to the Monitor 360 report recommendations, PG&E has not addressed some of the more significant Monitor 360 recommendations that relate to communications.

- The January 2015 Monitor 360 report includes three recommendations for PG&E. The first of three recommendations relates to communications and is shown in **Exhibit IX-17**.

Exhibit IX-17
Monitor 360 Recommendation

RECOMMENDATION #1: Use this narrative work to build out a culture change roadmap – which can touch communications, policy, and investments. Monitor 360 suggested “reframing” or “addressing” or “amplifying” following areas:

Narrative		Share of Impact 2014	Strategy
1.	Profit is King	21%	Reframe: Generate empathy for leadership pressures and decisions, and counter accusations that leadership does not care about workforce well-being by highlighting specific decisions where leadership prioritized safety over profit.
2.	Lost in Middle Management	17%	Address: Make clear and impactful decisions on how to streamline key management processes and empower front-line leaders to take ownership over decisions.
3.	Productivity Over Safety	16%	Reframe: Provide tangible, human examples that highlight the necessary and productive interrelationship between productivity and safety and counter false perceptions that productivity and safety are mutually exclusive.

⁴⁸ DR 364

⁴⁹ DR 364 Attachment 1

⁵⁰ DR 364

Narrative		Share of Impact 2014	Strategy
4.	Safety First	15%	Amplify: Continue to demonstrate leadership's deep commitment to prioritizing safety by highlighting examples of new safety efforts - especially in gas operations.
5.	On the Right Path	14%	Amplify: Develop periodic and timely communications that highlight continuous quick wins and progress on improving safety, while acknowledging shortcomings.
6.	Safety is a Burden	14%	Address: Engage employees to better understand which safety procedures and policies feel most burdensome and why, and identify 3-5 areas where leadership can take action to remedy these policies.
7.	Keep Quiet, Keep Working	3%	Reframe: Highlight examples of employees who were rewarded for speaking up on safety issues, while remembering that this narrative will not change overnight.

Source: DR 256 Attachment 1.

- In PG&E's response to the Monitor 360 recommendations was not to build a "culture change road map", as suggested, but to create the Speak up for Safety campaign, and a leadership video series that addresses leaders' commitment to safety as a priority:
 - What does it mean to speak up for Safety?
 - Why does speaking up for safety matter, personally?
 - Why is it important to raise safety issues?
 - Why is speaking up for safety critical?
 - It is NorthStar's assessment that the Speak Up for Safety campaign and the leadership videos only address items 4 – Safety First (impact 15 percent) and 7 – Keep Quiet, Keep Working (impact 3 percent) in **Exhibit IX-16**. It does not address any of the higher impact items listed in **Exhibit IX-16**, that could be "reframed" through communications, including:
 - Profit is King (impact 21 percent)
 - Productivity Over Safety (impact 16 percent).
- 7. The need to improve the "speak up" culture was identified as early as 2012, and Monitor 360 issued its recommendations in January 2015, but the Speak Up campaign was not implemented until Fall 2016. The overall effectiveness of the campaign is questionable.**
- The focus of the 2016 Speak Up for Safety campaign is on the importance of speaking up and how it improves safety for self and others.⁵¹ As explained in an August 3, 2016 presentation to the Safety and Risk Committee:

"The [safety communications] campaign supports the safety culture training underway for officers, managers and crew leaders by helping support the evolution PG&E's safety culture from one that *recognizes*

⁵¹ DR 347 Attachment 1

that nothing is more important than safety to *demonstrating* that through our behaviors and actions.⁵²

- An overview of the 2016 communications strategy as presented to the Safety and Risk Committee is shown in **Exhibit IX-18**.

Exhibit IX-18
Overview of 2016 Safety Communications Strategy

Element	Task
Campaign Objectives	<ul style="list-style-type: none"> • Present a clear, credible, relevant and compelling message around employee safety that gets employees to bring safety forward in their daily work. • Counteract negative safety perceptions among employees towards leadership. • Drive engagement with highest priority safety programs and activities.
Strategic Approach	<ul style="list-style-type: none"> • Focus on importance of speaking up, and demonstrate the many ways that speaking up improves safety for self and others.
Execution	<ul style="list-style-type: none"> • “Changing the conversation” as a statement that we are still evolving our culture to one where people feel safe to speak up, and see that we are better at safety when we talk openly about it. • Elements: Posters, brochures, signage, intranet, videos, newsletter articles and more.

Source: DR 475 Attachment 1.

- NorthStar reviewed the campaign and found that it does not support the objectives listed in **Exhibit IX-18**.
- Representative posters are shown in **Exhibit IX-19**. The posters do not mention “speaking up.” In NorthStar’s opinion, the posters are not compelling. For example, in the first poster, it is doubtful that anyone would (or should) submit a CAP due to almost running into a moving cart.

⁵² DR 475 Attachment 1

Exhibit IX-19
Representative Speak Up for Safety Campaign Posters



Source: DR 567 Attachment 1.

8. PG&E appropriately takes steps to measure and evaluate the effectiveness of employee communications regarding safety culture through its biennial Premier Surveys, and the quarterly “Know/Feel/Do” survey, and efforts such as the Monitor 360 analysis of survey results. However, PG&E is not always forthright in sharing results with the Board of Directors.

- As discussed in the Background section of this chapter, PG&E uses a number of methods to determine whether employees receive and understand communications. These methods include the biennial Premier survey and the quarterly “Know, Feel, Do” survey.⁵³
- These surveys measure employee opinions regarding several aspects of PG&E’s culture in addition to safety. PG&E uses the Premier Survey results, including the comments, as a tool to help leaders identify areas that need improvement. Based on survey results, all PG&E officers and directors are to be expected to develop an action plan to address areas where their organizations did not perform as well as desired.

⁵³ DR 746

These plans may be at the Director-level, or, if appropriate, at the manager or supervisor level.⁵⁴

- In its December 15, 2015, Safety Culture Update to the Board NOS Committee, PG&E described the Monitor 360 results as follows:

“The Utility has seen improvement in the way employees perceive leadership actions and motivations around safety. The Utility engaged a third-party consultant (Monitor 360) to analyze employee feedback in the OCDI and Premier surveys. The results showed that employees see a renewed commitment to safety from leadership, and employees believe that leadership values its people more than it values increased productivity.”⁵⁵

- The update did not inform the BOD that the Monitor 360 also found there continued to be themes of structural obstacles and cultural disconnects, and that the perceptions worsened in two areas related to safety culture (As previously shown in **Exhibit IX-10**):
 - Lost in Middle Management increased substantially across roles and LOBs, as a series of new initiatives created widespread confusion around processes and priorities.
 - Safety is a Burden increased, reflecting frustration with new policies that generate paperwork and change or systematize longstanding processes.⁵⁶

9. While PG&E’s use of surveys to measure PG&E’s culture is appropriate, it is challenging to perform meaningful trend analysis of the Premier Survey results because the questions change from year to year. The development of a consistent basis for future measurement and reporting may be useful for the company and regulators.

- The use of the Premier Survey and other similar surveys should be an effective tool for assessing overall effectiveness of the “safety culture” messaging. However, as shown in **Exhibit IX-20**, the safety culture-related questions change with each survey making trending difficult. The questions were the same in 2008, 2009 and 2010, and then began to change.⁵⁷

⁵⁴ DR 751

⁵⁵ DR 211 Attachment 004

⁵⁶ DR 211 Attachment 004

⁵⁷ DR 366 Attachment 001

Exhibit IX-20
Premier Survey Safety-Related Questions

Item	2010	2011	2012	2014	2016	2016 US Utilities Plus Benchmark [Note 1]
1. I have received the training I need to do a quality job.	72%	-	-	-	-	
2. People in my work area are protected from health and safety hazards.	89%	88%	-	-	-	
3. Action is taken to resolve unsafe situations that are identified or reported.	89%	-	-	-	-	
4. Anyone can, and does, stop a job if it is unsafe.	86%	91%	-	-	-	
5. I feel safe at work to do or say what I think is best for PG&E.	67%	-	-	-	-	
6. I believe that my immediate supervisor truly wants me to report safety hazards if I see them.	-	92%	-	-	-	
7. PG&E shows by its actions that it is committed to public safety.	-	-	87%	-	-	
8. I would not hesitate to discuss any safety issue with my work group.	-	-	94%	-	-	
9. My immediate supervisor sets a good example in safety.	-	-	87%	-		
10. When anyone at work is engaged in risky behavior, I will say something even if he or she is not likely to appreciate it.	-	-	91%	-		
11. The near-hit incidents that occur in my work group are reported to my immediate supervisor.	-	-	73%	-	74%	
12. I feel comfortable discussing safety issues with my supervisor.	-	-	-	91%	93%	
13. People in my work group report all injuries and incidents, no matter how minor.	-	-	-	71%	74%	
14. My supervisor acts quickly to correct safety issues.	-	-	-	87%	87%	
15. My work group follows safe work practices without taking short cuts.	-	-	-	-	93%	76%
16. Officers and Directors demonstrate through their actions that safety is a top priority at PG&E.	-	-	-	-	79%	67%
17. My supervisor insists that safety rules are carefully followed even if it means that work is slowed down.	-	-	-	-	89%	65%
18. I feel free to stop my work if I believe conditions are unsafe.	-	-	-	-	93%	75%

Note 1: The Utilities Plus benchmark is customized for PG&E and includes utilities and natural resource companies with high union ratios, safety focus and 24/7 operations. NorthStar has not reviewed this benchmark.

Source: DR 366 Attachment 1; DR 662 Supplement 1 Attachment 2.

- Safety-related questions generally receive high scores, even in 2010 and 2011. For example, as shown in **Exhibit IX-20** item 6, a question closely related to the “Speak Up” culture received a score of 92 percent in 2011 (Statement: “I believe that my immediate supervisor truly wants me to report safety hazards if I see them.”)

10. Electric T&D's Reach Every Employee is a good program to ensure leaders have annual documented safety discussions with each of their employees. The other operational LOBs – Generation and Gas Operations, do not have similar programs that require and track safety conversations.

- Electric T&D's Reach Every Employee (REE) Program was started in 2012 by Electric Distribution to ensure supervisors had at least one documented safety discussion with each of their employees annually. The Electric Transmission organization joined the REE effort in 2013 and the model has continued into 2016.⁵⁸
 - The initiative was created to improve communication between management and bargaining unit employees.
 - The goal of the initiative was to reaffirm management's commitment to employee and public safety and prioritize safety-related programs through the one-on-one safety discussions that each employee had with their leadership.
 - The discussion includes the Supervisor, the Superintendent/Manager, and the employee. The Supervisor and Superintendent/Manager make their commitment to the employee's safety and then the employee is asked to make his or her own commitment. While the Supervisor and Superintendent/Manager are provided a script to assist with the conversation, the intent of the REE program is to ensure that all employees are given a chance to have a personal conversation with their supervisors about safety and identify any barriers to doing work safely.⁵⁹
- During the safety discussion both the supervisor and employee sign Commitment letters (or agree that they've reviewed the document for those who do not wish to sign).⁶⁰ The Electric T&D REE Employee Safety Commitment Letter is shown in **Exhibit IX-21**.

⁵⁸ DR 148

⁵⁹ DR 148

⁶⁰ DR 314 Attachment 1

Exhibit IX-21

Electric T&D Reach Every Employee Employee Commitment Letter



Electric Transmission and Distribution Leadership Safety Commitment to Employees

Your health, safety and well-being are our #1 priority. Every employee has the absolute right and obligation to question, stop, and correct any unsafe act or condition.

"Walk by nothing. Challenge everything."

The following are the safety behaviors that all Electric Transmission and Distribution leaders will exhibit. These behaviors are our commitment to our employees. Each Director, Superintendent/Manager, and Supervisor will meet with the employee individually to commit and fully pledge to model the principles of the ***Safety Culture Change Initiative*** as well as the following behaviors:

- ***I will make personal and public safety my highest priority.***
- I will clearly communicate expectations to all employees whom I supervise and ensure each employee understands the value of, and expectations for, practicing the ***"Keys to Life"***, as well as following all rules, work procedures and ***Safety Principles***.
- I will clearly communicate expectations to all employees whom I supervise and ensure each employee understands the value of, and expectations for, ***speaking up about safety concerns, looking for safety hazards and intervening to stop unsafe acts, and properly documenting all work.***
- I will never place production or schedule over Safety. I will provide you the time needed for planning the job to be done safely and within our rules.
- I will ensure that my actions and words will always demonstrate a commitment to Safety.
- I will promote a safety conscious work environment. I will promote Near Hit Reporting.
- I will promote and recognize good safety behaviors.
- I will promote and reinforce use of fundamental Human Performance Improvement principles.
- I will practice visible leadership, coach, and mentor employees in the field.
- I will provide direct and timely feedback to employee safety concerns.
- I will communicate openly and honestly with all employees.
- I welcome differing opinions and will fairly and objectively consider them when making decisions.
- I will fully support the Grass Roots Safety program and associated efforts and initiatives.
- I will enforce work rules and procedures. I will enforce all work is done in accordance with all permits.
- I will support a knowledgeable workforce and ensure adequate training of employees.
- I will not allow an unsafe culture.

Employee Name:	Classification:	
Headquarters:	Date Communicated:	
Supervisor Name:	Superintendent/Manager Name:	
Employee Signature:	Date:	
Supervisor Signature:	Date:	
Superintendent/Manager Signature:	Date:	

Source: DR 148 Attachment 1.

- There is a similar letter for leadership (Directors, Managers and Superintendents) to sign during meetings with individual employees which lists safety behavior they commit to exhibit, including:
 - I will make personal and public safety my highest priority.
 - I will clearly communicate expectations to all employees whom I supervise and ensure each employee understands the value of, and expectations for, practicing the “Keys to Life”, as well as following all rules, work procedures and Safety Principles.
 - I will clearly communicate expectations to all employees whom I supervise and ensure each employee understands the value of, and expectations for, speaking up about safety concerns, looking for safety hazards and intervening to stop unsafe acts, and properly documenting all work.
 - I will never place production or schedule over Safety. I will provide you the time needed for planning the job to be done safely and within our rules.
 - I will ensure that my actions and words will always demonstrate a commitment to Safety.
 - I will promote a safety conscious work environment. I will promote Near Hit Reporting.
 - I will promote and recognize good safety behaviors.
 - I welcome differing opinions and will fairly and objectively consider them when making decisions.
 - I will fully support the Grass Roots Safety program and associated efforts and initiatives.
 - I will not allow an unsafe culture.⁶¹
- The REE document is revised each year based on feedback and alignment to company initiatives. The document is distributed via email with the expectation that every supervisor has a one-on-one discussion with each of their direct reports to review the commitments within the document.⁶²
- Employees and supervisors Commitment letter completions are tracked in by the Learning Academy using the course code ELEC-T914.⁶³
- Generation and Gas Operations do not have similar programs in which a leader sits down with each employee to discuss safety and requests the employee sign a commitment to safety.⁶⁴

⁶¹ DR 148 Attach 1

⁶² DR 875

⁶³ DR 148 Attach 1

⁶⁴ DR 875

11. Recent revisions to Electric T&D and Gas Operations safety awards programs to reward safe behaviors and practices rather than safety performance data should help to foster PG&E's new safety culture. Gas Operations safety recognition program continues to have some awards based on safety performance.

- Electric T&D and Gas Operations revised their safety recognition programs in 2015.⁶⁵ The programs moved away from rewards relating to reported accidents or injuries, and towards the encouragement of safe behaviors and practices. The programs are similar, with the awards described in **Exhibit IX-22**.

Exhibit IX-22
Electric T&D and Gas Operations Safety Recognition Awards

Award	Description
Safety Spot Award	Provided on the spot at the time a positive safety behavior or action is observed. Safety Spot Awards are non-monetary items such as a hat, or free lunch.
Safety Recognition Award	Provided after a positive safety behavior or action is observed and are generally presented to the recognized employee/employees in group settings such as weekly supervisor team meetings, monthly safety meetings, and/or quarterly leadership meetings. Safety Recognition Awards are monetary awards or taxable non-monetary awards.
Safety Recognition Event	A celebration such as a catered breakfast or luncheon with leadership to recognize exemplary safety performance of an individual, team, work group and/or organization.
Safety Champion Award	The Safety Champion Award is a special recognition awarded to employees by the Vice President of Electric Transmission Operations or Vice President Gas Operations.

Source: DR 480 Attachments 2 and 5.

- Power Generation's safety recognition program was implemented in January 2015, prior to the issuance of the Safety Recognition Program Guidelines. As highlighted in **Exhibit IX-23**, some of the awards emphasize safety performance and results:

Exhibit IX-23
Power Generation Safety Awards

Award	Description
Organization Recognition	Recognize all employees that identify and communicate recommendations that have a positive influence on employee and public safety and implement changes that improve the ability to significantly reduce exposure to safety risks. Intended for the Directors and Managers to acknowledge employees for going above and beyond ordinary safety performance expectations. This recognition is intended to be the delivery of a public (or private) "thank you" and, could also include such things as a positive contact letter to a personnel file, special meal, personalized gift, and/or gift card for recognized employees.
Team Recognition	Recognize the actions and behaviors that lead to superior safety results for specific teams (all employees reporting to a Supervisor.)

⁶⁵ DR 480

Award	Description
	<p>Each month, all first line supervisors are expected to host a breakfast or lunch (or other special gathering) with the purpose of discussing the team's safety performance over the prior month with specific discussion on safety issues and risks to consider for the upcoming month.</p> <p>The emphasis of this gathering is to publicly celebrate the safety performance of each team and to share lessons learned, best practices, and near hits or misses that the team might have experienced in the prior month.</p>
Individual Recognition	<p>Recognize individual actions and behaviors that represent PG&E's Personal Safety Commitment and contribute to superior safety results for their team. Supervisors and peers acknowledge individuals for going above and beyond ordinary safety performance expectations.</p> <p>The emphasis for this recognition is intended to be the delivery of a public (or private) "thank you" and, from supervisors, should also include a positive contact letter to a personnel file, special meal, and/or gift card for a recognized employee.</p>
Vice President's Award	<p>Recognize the achievements of Power Generation teams and individuals that achieve significant safety milestones or demonstrate superior safety behaviors. Significant achievements will be determined at the Vice President's discretion but will include such things as challenging projects completed without safety incidents; significant periods by a team or organization without a safety incident; or actions taken by teams or individuals that significantly improve safety conditions in the workplace.</p> <p>An organization, team, or employee that receives the Vice President's award receive a special meal hosted by the Vice President and a Vice President's award certificate acknowledging the superior safety achievement</p>

Source: DR 480 Attachment 1.

- PG&E also issues the Sibley Safety Award as part of an overall annual Employee Champion Awards Ceremony.⁶⁶ The award recognizes organizations that make outstanding contributions toward the safety and health of the public, PG&E employees, PG&E contractors, and PG&E customers.⁶⁷ The award is a charitable grant donated to a safety-related non-profit of the winning team's choice so long as the charity has a relationship to safety.⁶⁸

12. The IBEW has input into PG&E's safety communications.

- IBEW Local 1245 (IBEW) represents about 12,000 PG&E employees in physical and clerical classifications.
- The IBEW has its own safety programs, separate from PG&E's, which include:
 - The IBEW 1245 Safety Committee – The Safety Committee monitors safety conditions throughout the union's area of operations. The Safety Committee has a rotating membership, drawn from various Local 1245 employers.
 - The Peer-to-Peer Safety Initiative – This initiative puts members themselves directly in charge of looking out for their own safety and the safety of their

⁶⁶ DR 480

⁶⁷ DR 295

⁶⁸ DR 480

brothers and sisters on the job. This initiative consists of three programs: Hold the Pole (Electric), Control the Pressure (Gas), and Keep the Clearance (Trees).

- Safety Stewards – Safety Stewards are volunteers appointed by the union who understand safe work practices, follow them, encourage others to do the same, and intervene when necessary to address unsafe work practices.
 - Near-Miss Reporting – Also known as Close Call reporting, near-miss reporting provides members a chance to anonymously report near-misses so that others can learn from their experience.
 - Unit Meetings – The meetings provide every member in the union a chance to report on accidents, which unit officers then report to the IBEW Local 1245 Safety Committee.⁶⁹
- IBEW representatives participate in a number of PG&E safety-related committees and attend meetings with represented employees and PG&E management.⁷⁰
 - IBEW and ESC leadership currently participate on the Safety and Risk Committee, and they also participated in its predecessor, the Chairman’s Safety Council.
 - Some LOB safety councils have IBEW and ESC leaders as participants.
 - There are ad hoc and standing committees with both PG&E and IBEW representation to address specific safety issues such as rubber gloving, fire resistant clothing, and double belting.⁷¹
 - When PG&E negotiates a new agreement with its unions related to a significant safety issue, it communicates the changes to its employees. These communications are often reviewed by union leadership. One example is a February 2014 email from PG&E, IBEW, and ESC leadership to PG&E employees announcing the signing of a Letter of Agreement between PG&E and IBEW related to the sharing and reporting of near hits:

“This agreement reinforces PG&E’s commitment to foster a culture of trust an open dialogue in which near hits can be openly shared without the use of disciplinary action. This is a significant change from past practices and one we wholeheartedly believe is the right approach in order for us to build a safety-first culture.”⁷²
 - PG&E also specifically requests the input on a communication from IBEW in some cases. For example:
 - When PG&E was developing its Speak Up for Safety campaign, its Communications department met with IBEW leadership on multiple occasions to ensure the messaging was appropriate and would resonate with PG&E’s

⁶⁹ <https://ibew1245.com/safety-matters/>

⁷⁰ DR 746

⁷¹ DR 452

⁷² DR 66 attachment 40

represented workforce. One of the deliverables of the campaign was signage that featured a quote from an IBEW Business Manager.⁷³

- The two unions reviewed and approved a postcard created in remembrance of National Work Memorial Day (a global remembrance of those who died on the job). The postcard featured the IBEW and ESC logos and was distributed to PG&E employees at their work locations.⁷⁴
- The 2016 table agreement reached between PG&E and IBEW includes a new Safety Partnership Committee, described in the agreement as follows:

“The Company and Union agree that nothing is more important than the safety of PG&E employees, contractors, and the public. In order to improve and sustain the safety culture at PG&E, it will be imperative that the parties jointly cooperate on this issue. Therefore, the parties have agreed to establish a Safety Partnership Committee that will develop a clear charter focused on how the Company and Union can partner to create and execute safety initiatives. The Safety Partnership Committee shall consist of an equal number of employees that will be appointed by the Company and the Union respectively.”⁷⁵

13. PG&E has a comprehensive plan to communicate with customers in case of emergency issues.

- PG&E’s Company Emergency Responsibility Plan (CERP) outlines the internal and external communications and coordination process in the event of an emergency. The purpose of the CERP is to assist PG&E personnel with a safe, efficient, and coordinated response to an emergency incident affecting gas or electric systems in the PG&E service territory.⁷⁶
- The CERP outlines the plan to communicate with the media and the public, including PG&E customers.
 - PG&E’s Public Information Office serves as the company’s official point of contact for outgoing announcements and briefings to employees, the media, customers and all other external audiences.
 - The CERP outlines a structured emergency management organization specified roles for senior executives, operating executives and incident management teams (IMTs). IMTs, when assembled, have direct authority to plan and execute the response.
 - The IMT command staff includes a Customer Strategy Officer (CSO) who provides updates to customers, addresses customer issues, and communicates high-priority outage concerns to the emergency operations team. In the

⁷³ DR 746

⁷⁴ DR 746 and DR 440 Attachment 1

⁷⁵ DR 694 and http://ibew1245.com/wp-content/uploads/2016/11/2016-IBEW-TA_Clerical-with-11-3-16-with-Attachments-A-and-B.pdf

⁷⁶ DR 468 Attachment 2 Confidential

Emergency Operations Center (generally for severe and catastrophic incidents, the CSO coordinates with the Customer Contact Emergency Coordination Center (CCECC), CSOs in the regional operations centers, and the Public Information Office on customer communication strategy.

- The CCECC coordinates contact center response to emergencies. The CCECC compiles facility, operational, and customer status information from all contact centers and reports to the Customer Strategy Staff in the EOC.⁷⁷
- According to CERP, in an emergency, the primary points of contact for PG&E customers are PG&E's contact centers or pge.com.
 - The contact centers are open 24 hours a day, seven days a week, and they continue to be the primary avenue customers use to report emergencies. Contact centers provide multi-lingual and telephonic services for customers who are speech and hearing-impaired.
 - The company website, pge.com, also provides customers with current information on electric outages. Customers can report electric outages and subscribe to automatic updates via text, voice message, or email.⁷⁸

D. RECOMMENDATIONS

1. Develop and implement a strategic communications plan that does not overwhelm employees with too much information, but effectively addresses the issues identified in the January 2015 Monitor 360 Study, the 2016 Premier Survey (and PG&E's narrative analysis.)
2. Develop a consistent basis for measuring, tracking and trending employee attitudes regarding safety culture.
3. Develop and implement programs similar to Electric T&D's Reach Every Employee program in Power Generation and Gas Operations.
4. Assess the effectiveness of the 2016 Speak Up Culture campaign, particularly among field resources.

⁷⁷ DR 468 Attachment 2 Confidential

⁷⁸ DR 468 Attachment 1

CHAPTER X: SAFETY REPORTING/CORRECTIVE ACTION

This chapter provides the results of NorthStar's review of the various incident reporting systems and associated investigation processes currently employed by PG&E, including the CAP, Near Hit Reporting, and the SIF Prevention Program. A description of the various incident reporting systems can be found in Appendix A.

A. BACKGROUND

PG&E defines a safety incident as an unplanned sequence of events with the potential for undesirable consequences.¹ Safety incidents include MVIs or injuries to employees, contractors or the public.

Employee Injuries

The Occupational Safety and Health Act of 1970, requires certain employers to prepare and maintain records of work-related injuries and illnesses. This information is reported to OSHA. The *Log of Work-Related Injuries and Illnesses* (Form 300), is used to classify work-related injuries and illnesses and to note the extent and severity of each case. An injury or illness is considered work-related if an event or exposure in the work environment caused or contributed to the condition or significantly aggravated a pre-existing condition. Injuries must be reported if they result in death, loss of consciousness, days away from work, restricted work activity or job transfer (collectively known as DART), medical treatment beyond first aid, and any illnesses that are significant or meet additional criteria as defined by OSHA. **Exhibit X-1** provides PG&E's OSHA Incident and LWD rates from 2013 through July 2016.

Exhibit X-1
PG&E OSHA and LWD Incidents (2013 – July 2016)

Calendar Year	OSHA Incident Count	OSHA Incident Rate	LWD Incident Count	LWD Incident Rate	Total Employee Labor Hours
2013	454	2.068	75	0.342	43,898,780
2014	548	2.456	85	0.381	44,634,158
2015	595	2.611	85	0.373	45,571,564
2016 (7 months)	322	2.340 [1]	40	0.291	27,523,221

Note 1: Calculated value.

Source: DR 212, Supplement 002 Attachment 005. Note: DR 843 provides higher LWD counts.

The majority of PG&E employee injuries are sprains and strains and musculoskeletal issues as shown in **Exhibit X-2**. These accounted for over 58 percent of the injuries during the January 1, 2011 through July 31, 2016, time period.

¹ DR 495 Attachment 002-007

Exhibit X-2
Employee Injuries by Type
(January 1, 2011 – July 31, 2016)

Nature	Number	Percent of Total
Sprain/Strain	5,558	45.6%
Musculoskeletal (tendonitis)	1,561	12.8%
Nervous System (carpal tunnel)	576	4.7%
Bruise Contusions	563	4.6%
Animal/Insect Bite	529	4.3%
Other Conditions/Disease	523	4.3%
Cut/Laceration	463	3.8%
Other Traumatic Injury	387	3.2%
Ear/Hearing Disorder	254	2.1%
Symptoms (Eyestrain, Nausea)	210	1.7%
Skin (dermatitis, poison oak)	186	1.5%
Abrasion/Scratch	183	1.5%
Psyche (Anxiety, Stress)	114	0.9%
Eye Disorder (Welder's Flash)	102	0.8%
Respiratory (metal fume fever)	95	0.8%
Puncture	80	0.7%
Chemical Poison/Toxic Effect	77	0.6%
Foreign Body (Splinters, etc.)	76	0.6%
Not Assigned	76	0.6%
Unknown	67	0.5%
Chemical	60	0.5%
Heat/Scalds	58	0.5%
Heatstroke	57	0.5%
Fracture (Bone or tooth)	54	0.4%
Dislocation	43	0.4%
Hernia/Digestive System	42	0.3%
Electric Shock	31	0.3%
Radiation	31	0.3%
Circulatory System	29	0.2%
Electric	28	0.2%
Infectious	21	0.2%
Blister	18	0.1%
Concussion	17	0.1%
Crushing	11	0.1%
Abnormal Lab Test	3	0.0%
Amputation	3	0.0%
Hypothermia/Cold Injury	3	0.0%
Cold	2	0.0%
Total	12,191	100.0%

Source: DR 212, Supplement 002 Attachment 001 - CONFIDENTIAL.

The back and spine are the most commonly injured, followed by shoulders, wrists and knees. These four body parts account for almost 42 percent of all reported injuries during the five and one-half year period.²

Exhibit X-3 provides PG&E's serious injury and fatality data from 2007 through 2016.

Exhibit X-3
PG&E Serious Injuries and Fatalities (Actual) – Employees Only
(2011 - 2016)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Serious Injuries	11	9	3	3	5	6	9	2	4	3	55
Fatality		2	2	2	3	1			1	1	12
	11	11	5	5	8	7	9	2	5	4	67

Source: DR 843.

Motor Vehicle Incidents

PG&E defines MVIs as all incidents involving: 1) a PG&E vehicle or equipment at any time; 2) vehicles rented or leased through the company, driven on PG&E business; or 3) employees driving their own vehicles for PG&E business.³ MVIs include those events involving a 3rd party at fault. Serious MVIs, Preventable MVIs (PMVIs) and SPMVIs are subsets of MVIs.

- The National Safety Council defines a PMVI as follows: “a preventable incident is one in which the driver failed to do everything reasonable to avoid being involved in the incident.”⁴
- PG&E defines a Serious MVI as one where one or more of the following conditions occur: injuries that require immediate treatment away from the scene of the incident, a vehicle is towed (any party involved), or vehicle damage exceeds \$5,000.⁵
- A confirmed SPMVI is an incident that meets the definitions of an MVI, Serious and Preventable as determined by a completed incident investigation, confirmation of the facts by a Litigation & Claims Inspector, or confirmation of the facts by LOB Leadership.⁶

PG&E's MVIs have been trending upward since 2013, as shown in **Exhibit X-4**. In 2015, PG&E reported a total of 470 MVIs; there were 429 reported MVIs in the first seven months of 2016.⁷ The number of miles driven has been increasing from 79.3 million miles in

² DR 212, Supplement 002 Attachment 001- CONFIDENTIAL

³ DR 212 Supplement 002

⁴ National Safety Council “Guide to Determine Motor Vehicle Accident Preventability”

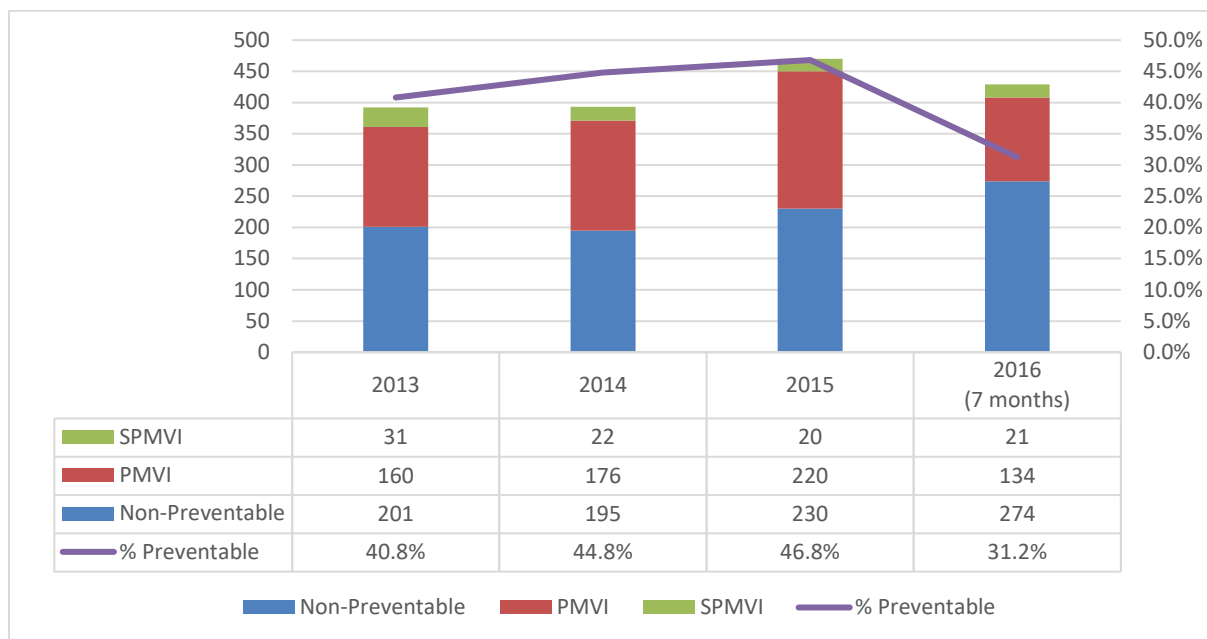
⁵ DR 004 Attachment 004. Prior to 2014, PG&E used a different definition of SPMVI (DR 212)

⁶ DR 004 Attachment 004

⁷ DR 212 Supplement 002 Attachment 004

2013 to 88.1 million in 2015. Through July 2016, PG&E employees had driven 81.4 million miles. In 2015, PG&E reported 20 confirmed SPMVIs; through July 2016, 21 SPMVIs had been confirmed and 7 were pending confirmation.⁸

Exhibit X-4
PG&E MVIs (2014 – July 2016)



Note 1: The 21 SPMVIs reported for 2016 to date do not include an additional 7 that were pending review and potential confirmation.

Note 2: Depending on the timing of when the data was pulled, counts may differ as incidents may change categories. (See also DR 880 Attachment 001).

Source: DR 212 Supplement 002 Attachment 004.

Near Hit Reporting

Following San Bruno, PG&E began leveraging existing, decentralized near hit reporting processes and systems to encourage employees to look for safety issues.⁹ A near hit can be described as an incident that occurred and did not cause harm to a person – PG&E employee, PG&E contractor, or the public – but could have resulted in injury. The Near Hit Program was implemented with the expectation that events that cause or can cause injuries might be reduced through identifying and mitigating those factors that could potentially lead to or cause the event, and that all employees can learn from these experiences.

In 2013, work began to build consensus on an enterprise-wide Near Hit Program.¹⁰ In 2014, PG&E developed a review prioritization process based on potential severity, and

⁸ DR 212 Supplement 002 Attachment 004

⁹ DR 861 and Attachments

¹⁰ DR 861 and Attachments

signed letters of agreement with the IBEW and ESC offering represented employees protections for submitting near hits.¹¹

The Near Hit Program involves the following steps: 1) An employee observes a near hit; 2) the employee submits the information (through one of the reporting systems discussed in Appendix A); 3) an assigned review team analyzes the near hit, determines a potential severity level and next steps; and, 4) corrective actions are taken as appropriate.

Serious Injury or Fatality Prevention Program

In late 2014/2015, PG&E began to focus on understanding and preventing both actual and potential SIFs.¹² The intent of the SIF Prevention Program is to mitigate incidents with the greatest potential for significant injury.¹³ SIFs are incidents which result in a life-threatening or life-altering injury or a fatality.¹⁴

- PG&E defines a life-threatening injury as an “acute injury that requires immediate life-preserving rescue action, and if not applied immediately would likely have resulted in the death of that person.”¹⁵
- A life-altering injury is “an acute injury that resulted in a permanent and significant loss of a major body part or organ function that permanently changes or disables that person’s normal life activity.”¹⁶

“SIF Exposure” is the sum of actual and potential SIFs.

- **SIF Actual** is a life-threatening or life-altering injury to, or a fatality of, an employee resulting from work on, or caused by, a failure or malfunction of PG&E facilities. A SIF Actual is a subset of a serious safety incident. A serious safety incident includes contractors and members of the public. As defined by PG&E, a SIF actual event can be unrelated to work on or caused by a failure or malfunction of PG&E facilities as long as the SIF occurred while the employee or contractor was working (e.g., an employee fatality while driving a company vehicle for work purposes.)¹⁷
- **SIF Potential** is an outcome of an event that had a reasonable and realistic possibility (as per SIF decision logic) to result in an actual SIF. SIF precursors are those high-risk situations in which management controls are either absent, ineffective, or not complied with, and which will result in a serious or fatal injury if allowed to continue.¹⁸

¹¹ DR 004 Supplement 001 Attachment 009

¹² DR 004 Attachment 004

¹³ DR 004 Attachment 004, Orientation Presentation

¹⁴ DR 004 Attachment 004

¹⁵ DR 203 Attachment 001 Enterprise Causal Evaluation Standard (Utility Standard: GOV-6102S)

¹⁶ DR 203 Attachment 001 Enterprise Causal Evaluation Standard (Utility Standard: GOV-6102S)

¹⁷ DR 757

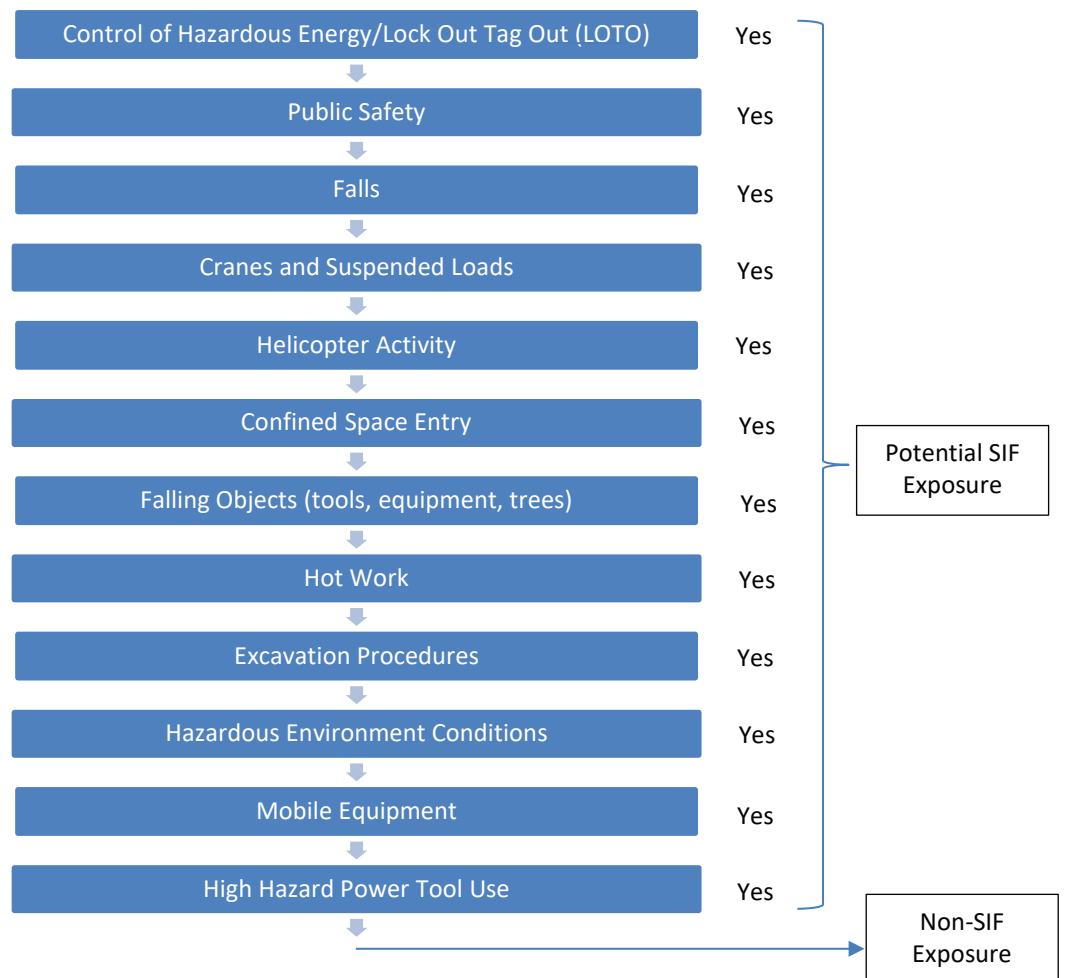
¹⁸ DR 583 Attachment 1 - CONFIDENTIAL

As part of the SIF Prevention Program, PG&E developed definitions of actual and potential SIFs; reviewed historical data (actual incidents and injuries, near hits and CAP submittals) to identify actual and potential SIFs; performed causal evaluations to better understand SIFs and identify risk factors; and, developed SIF exposure decision trees. To assist the field in mitigating risks, PG&E developed SIF checklists to use in developing job packets provided to the field crews and to be used by Supervisors conducting field observations.¹⁹ PG&E also developed SIF Pocket Guides for field employees as a replacement for the Safety and Performance Fundamentals Handbook.²⁰

Exhibit X-5 provides an illustrative example of a SIF Exposure Decision Tree.

Exhibit X-5
SIF Exposure Decision Tree Example – Power Generation

Did the Event Involve...



Source: Materials provided during IR 194.

¹⁹ DR 583 Attachment 007, IR 191 - 194

²⁰ DR 583 Attachment 007, IR 191 - 194

Corrective Action Program

DCPP established a Corrective Action Program in 1984 in response to a nation-wide Institute of Nuclear Power Operations (INPO) initiative. The prime objective of the DCPP CAP is to ensure that conditions adverse to quality within a nuclear facility are promptly identified and corrected – thus avoiding potential catastrophic events. PG&E views a modified version of this program as its eventual cornerstone for reporting incidents, events and potential safety issues enterprise-wide.

In October 2013, Gas Operations implemented a modified version of the DCPP CAP, in support of its PAS 55 Certification.²¹ Since that time, PG&E has further modified the CAP with the intent to implement it enterprise-wide across all LOBs. It is intended that CAP will provide standardized governance and innovative tools for PG&E personnel to easily report, prioritize, track, trend and resolve issues, resulting in an enhanced safety culture, reduced risk, and a more efficient and compliant organization.²² To successfully implement Gas Operations CAP, PG&E spent months analyzing DCPP's CAP, hired a dedicated staff, and improved the existing model by creating a dashboard and developing a mobile app.²³

There are five methods to enter notifications into CAP: intranet (dashboard), the mobile app, SAP, paper/manual submittal and telephonic submittal during business hours.

Gas Operations has established a dedicated CAP team to review the CAP submittals. As of July 2016, the team consisted of a Manager with six direct reports and nine additional specialists – a total of 16 individuals.²⁴ In November 2014, Gas Operations established the Notification Review Team (NRT) and the Corrective Action Review Board (CARB).²⁵ The NRT was established to ensure all CAP notifications are reviewed and assigned for resolution.²⁶ NRT members are subject matter experts from selected gas organizations and are required to hold the position for a minimum of six months.²⁷ An additional, approximate 50 individuals may serve as NRT members.²⁸ There are 12 CARB members.²⁹

Currently, all notifications are evaluated daily (Monday through Friday) by the NRT.³⁰ **Exhibit X-6** provides an overview of the review process.

²¹ May 11, 2016, ECAP Orientation Presentation (IR 14), DR 512. Although not a specific requirement of PAS 55, PG&E used CAP to satisfy clause 4.62 and 4.65 requirements.

²² DR 004 Supplement 1, Attachment 008

²³ IR 090

²⁴ DR 271 Attachment 001

²⁵ DR 274 Attachment 007

²⁶ An initial criticism of CAP was that items were assigned to the initiator for resolution. PG&E refers to this as the boomerang effect.

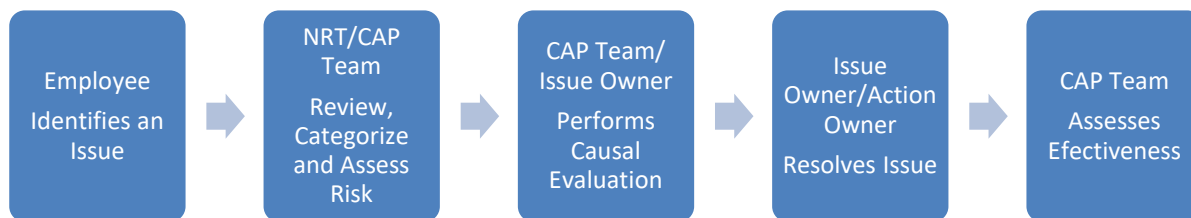
²⁷ DR 438 Attachment 004

²⁸ DR 218

²⁹ DR 218

³⁰ IR 134

Exhibit X-6 CAP/NRT Process



Source: DR 061 Attachment 002.

The Gas Operations NRT reviews notifications entered over the previous twenty-four hours or the previous seventy-two hours on Mondays. An automated report is generated daily at 7:30 AM and distributed via e-mail to Gas CAP employees and members of the NRT. NRT members are expected to review notifications prior to the 11:00 NRT meeting. The NRT must have eight members present and is typically represented by Mapping, Engineering, Integrated Management, Codes and Standards, Compliance and Gas CAP.

The NRT/CAP Review Team (CRT) uses a risk assessment matrix to determine the level of risk. The assessed risk level considers the severity or potential severity of the item on a scale from 1 to 4 (PG&E added a fifth severity level effective January 1, 2017) and its likely frequency (rare, possible, likely and almost certain).³¹ The severity level considers potential safety, reliability, financial, regulatory environmental and reputational effects.³² The risk level determines the type of causal evaluation required. The NRT also assigns ownership for the CAP item to ensure its resolution.³³

A “Reader” leads each NRT/CRT meeting, identifying each notification one-by-one, briefly describing the event, announcing an initial disposition or asking questions of the team regarding clarification, input, or opinion. Most commonly, the Reader calls out a disposition, one or two members orally affirm the disposition, and the Reader moves on to the next notification. As part of the review, the Reader and/or CAP team assigns all notifications to a Work Center that has responsibility for correcting and/or closing issues.³⁴

In the 33-month period from October 29, 2013 – July 25, 2016, only 34 of over 23,000 Gas CAP submittals were considered high risk, as shown in **Exhibit X-7**. About 21 percent of the Gas CAP submittals over the 33-month period were classified as Medium Risk.

³¹ DR 408 Attachment 002, Gas CAP NRT Process Direct Observations on 7/27/16 (IR 134) and 10/27/16 (IR 207) and Utility Procedure TD-4020P-01, Rev: 3, effective date 01/01/2017

³² DR 408 Attachment 002, Gas CAP NRT Process Direct Observation on 7/27/16 (IR 134) and 10/27/16 (IR 207)

³³ DR 004 Supplement 1, Attachment 008, Gas CAP NRT Process Direct Observation on 7/27/16 (IR 134) and 10/27/16 (IR 207), DR 408 Supplement 001 Attachment 001

³⁴ IR 090

Exhibit X-7
Gas CAP Risk Levels
(October 29, 2013-July 25, 2016)

Risk Level	Number of Items	Percent
Low	18,030	77.02%
Medium	4,938	21.10%
High	34	0.15%
Non-CAP	314	1.34%
Unclassified	92	0.39%
Total	23,408	100.0%

Source: DRs 214 Supplement 002 Attachment 001-CONFIDENTIAL and Attachment 002-CONFIDENTIAL.

PG&E has made improvements to the Gas Operations CAP review process. Gas Operations requires its supervisors/superintendents to work in the San Ramon Control Center on a one-week rotational basis to enhance their operational expertise. These individuals now attend the NRT meetings, bringing a field perspective to the team and improving the quality of discussion.³⁵ When CAP was initially implemented, the Action Owner reported completion of corrective or preventive actions and the Issue Owner ensured acceptable completion.³⁶ With Revision 3 to the Gas CAP Procedure, an Independent Verifier (from the CAP organization) is responsible for verifying completion of corrective actions for high risk issues within 30 days of issue closure.³⁷ Effective January 1, 2017, the Independent Verifier also assesses a random sample to verify proper completion of corrective actions.³⁸

The majority of the Gas CAP submittals as of July 25, 2016, were issues of inadequate, incomplete or unavailable mapping records, as shown in **Exhibit X-8**. Evaluation requests, the second most frequently used category, consists of requests for the review of processes, procedures, employee concerns, training or requests focused on improved outcomes.³⁹

Exhibit X-8
Gas CAP Work Type
(October 29, 2013-July 25, 2016)

Work Type	Number of Items	Percent
Records	9,554	40.8%
Evaluation Request	4,789	20.5%
Human Performance	2,179	9.3%
Facilities/Tools	2,235	9.5%
Operations	1,536	6.6%
Safety	897	3.8%

³⁵ IR 189 and NorthStar Observation at Gas Operations NRT meeting (IR 207)

³⁶ DR 274 Attachment 019, Gas CAP Standard, effective 11/3/2014, Rev: 2

³⁷ DR 408 Attachment 001, Gas CAP Standard, effective 2/17/2016, Rev: 3

³⁸ DR 408 Supplement 001, Attachment 001, Gas CAP Standard, effective 1/1/2017, Rev: 4

³⁹ DR 214 Supplement 002, Attachments 001 and 002 – Both CONFIDENTIAL, March 17, 2017 verification request email from PG&E

Work Type	Number of Items	Percent
Documentation	973	4.2%
Dig-in	361	1.5%
Training/Qualifications	252	1.1%
Blank Record	198	0.8%
Material	177	0.8%
Design	181	0.8%
Emergency Preparedness	39	0.2%
Environmental	37	0.2%
Total	23,408	100.0%

Source: DR 214 Supplement 002, Attachments 001 and 002-Both CONFIDENTIAL

CAP was rolled out to S&SS in October 2015. Ninety-eight percent of the S&SS CAP submittals between October 22, 2015 and August 1, 2016 were low severity.⁴⁰ A breakdown by type is provided in **Exhibit X-9**.

Exhibit X-9
S&SS CAP Work Type
(October 22, 2015-August 1, 2016)

Work Type	Number of Items	Percent
Evaluation Request	685	48.48%
Safety	196	13.87%
Equipment	118	8.35%
Tools	105	7.43%
Human Performance	64	4.53%
Guidance Documentation	53	3.75%
Operations	44	3.11%
Security	40	2.83%
Materials	35	2.48%
Records	27	1.91%
Environmental	21	1.49%
Training/Qualifications	14	0.99%
Engineering	6	0.42%
Blank Record	5	0.35%
Total	1,413	100.0%

Source: DR 214 Supplement 002 Attachment 005.

CAP was implemented in Power Generation on July 25, 2016 and Electric T&D on November 7, 2016.⁴¹ PG&E expects to implement CAP throughout the organization by July 2017.⁴² PG&E further intends that all LOBs will use the CAP system to record near hits by the end of 2017.⁴³ Currently near hits are reported in a number of systems.

⁴⁰ DR 214, Supplement 002, Attachment 005

⁴¹ IR 43, March 17, 2017 verification request email from PG&E

⁴² IR 43

⁴³ DR 004 Supplement 001 Attachment 009

Causal Evaluation Processes

Injuries, significant incidents, SIFs (actual and potential), near hits, and CAP submittals are subject to an investigation/evaluation process. Differing levels of analysis and validation are required by PG&E depending on the nature of an incident. Other than self-care, all injuries require some form of investigation. **Exhibit X-10** summarizes the incident investigation requirements.

Exhibit X-10 Incident Review Requirements

Type	Analysis	Validation/Verification
Self-Care	None required. At the request of a Supervisor or Safety Specialist, a Supervisor Incident Analysis Packet (SIAP) short form may be used to collect Work Group Evaluation data.	Safety Specialist verifies actions completed.
Injury	SIAP long form to collect cause evaluation data.	Safety Specialist verifies actions completed.
Serious Injury	SIAP long form to collect cause evaluation data. SAFE-1004S Procedure. Causal evaluation required.	Validation of completion and effectiveness required. Performed by LOB.
MVI	MVI SIAP to collect cause evaluation data.	Safety Specialist verifies actions completed.
Near Hits	Near Hit SIAP required for severity potential 1 and 2 incidents to collect cause evaluation data. Casual evaluation also required	Safety Specialist verifies actions completed.
Other CAP Items	Unless otherwise determined by management: <ul style="list-style-type: none"> • High Risk – Root Cause Evaluation • Medium Risk – Apparent Cause Evaluation for SIF potential or Work Group Evaluation • Low Risk – Work Group Evaluation or closed as trend item 	Root Cause Evaluations and Apparent Cause Evaluations for SIF potential events have predetermined effectiveness review criteria established by the root cause team at the time of the corrective action development. This criterion is assessed after sufficient runtime of the corrective actions to validate effectiveness.

Source: DR 062 Attachment 001, and Verification Request (DR 889).

Initially, the injured employee's supervisor completes a Supervisor Incident Analysis Packet (SIAP) for all injuries other than self-care. The SIAP requires basic information about, and a description of, the incident. The supervisor must identify one direct cause, can identify multiple contributing causes, and must include a recommended corrective action.⁴⁴ Corrective actions must then be verified. Serious injuries require detailed causal evaluations. For a Non-Serious Injury as defined by Cal/OSHA, the supervisor completes a SIAP and the LOB will determine if the incident is a SIF potential.⁴⁵ If the LOB determines the incident is a SIF potential, the LOB will also investigate in accordance with its internal procedures

⁴⁴ DR 062 Attachment 002

⁴⁵ DR 530

performing a more detailed causal evaluation.⁴⁶ High and medium risk near hits and CAP items are also subject to causal evaluation.

SEMS gatekeepers review CAP submittals and reported near hits to identify anything that looks like it might be an injury.⁴⁷ In late 2016/2017 PG&E plans to automatically route non-serious injuries to the CAP system following intake by the 24/7 Nurse Report Line.⁴⁸

PG&E defines a Serious Injury as one of the following: a fatality; an injury or illness involving hospitalization (for more than observation); a loss of body part (including tips of fingers); any permanent disfigurement; electrical contact or flash requiring medical attention; a serious concealed danger; a systemic incident; or use of emergency response services.⁴⁹ A systemic incident is “one involving work processes, tools or equipment that could potentially impact the entire utility and therefore may require notification of the incident throughout the utility.”⁵⁰

A Causal Evaluation (CE) is a structured process used to determine, document and communicate the cause or reason why an incident, issue or error occurred. CEs are necessary to identify the cause of the incident, issue or error, to prevent or minimize the probability of recurrence and to apply continuous improvement. PG&E CEs use various problem solving methods and tools (i.e., Human Factors Analysis and Classification System, Failure Analysis, Process Hazard Analysis) to identify the underlying causes that led to an incident occurring. Management may use CEs to identify the Apparent Cause, Contributing Causes, the Root Cause, and/or the Extent of Cause. According to procedures, management shall determine what type of CE is appropriate based on the significance and frequency of incident. Types of CEs include:⁵¹

- A Root Cause Evaluation (RCE) is a structured, formal evaluation process that requires a team and uses industry-accepted analysis methods to determine the root cause of a problem. Corrective actions must be developed and effectiveness reviews are performed after actions have been in place for a specified period of time.⁵² Serious safety incidents and high risk items require an RCE.⁵³ The goal is to complete RCEs in 90 days.
- An Apparent Cause Evaluation (ACE) is an easy-to-use template-driven evaluation that can be completed by one or two evaluators in about 30 days.⁵⁴ An ACE is an

⁴⁶ DR 530

⁴⁷ IR 45

⁴⁸ DR 530

⁴⁹ Safety Procedure 202 (DR 530 Attachment 001). A fatality; an injury or illness involving hospitalization (for more than observation); a loss of body part (including tips of fingers); and any permanent disfigurement are classified as a serious incident by Cal/OSHA regulations. The remaining are included by PG&E in addition to Cal/OSHA regulations.

⁵⁰ Safety Procedure 202 (DR 530 Attachment 001)

⁵¹ Utility Standard: GOV-6102S, Publication Date: 05/11/2015 Rev: 0 (DR 203 Attachment 001)

⁵² DR 203 Attachment 001

⁵³ DR 203 Attachment 001

⁵⁴ DR 004 Supplement 001 Attachment 008

evaluation based on readily available information that provides reasonable assurance that the cause of a problem is determined and will be corrected.⁵⁵ ACE's may have, but are not required to have, an effectiveness review plan.⁵⁶ Depending on the nature of the issue, medium risk items typically receive an RCE or a Work Group Evaluation.

- A Work Group Evaluation (WGE) is a less structured, informal evaluation based on a work group's experience, knowledge, and understanding of associated risks, and their ability to determine that the cause of a problem is identified and will be corrected or improved.⁵⁷ A WGE takes less than 2 days and involves a subject matter expert and supervision.⁵⁸

A CAP specialist may designate CAP items as "trend-only", that is, there is no required causal evaluation. This takes about 5 minutes. These items are used for aggregate trending.⁵⁹ Low Risk items are either closed directly as a trend-only item, or the likely cause is evaluated using a WGE.

Investigations are led by the LOB with causal evaluations lead by the Corporate Field Safety Operations organization within S&SS.⁶⁰ Each LOB (Customer Care, IT, Electric T&D, Gas Operations, Power Generation, DCCP, and S&SS) has its own causal evaluation procedures.⁶¹

B. EVALUATIVE CRITERIA

The evaluative criteria include the following:

- Do confidential safety reporting systems exist and are employees comfortable using them?
- Are reported near hits meaningful and used in a constructive manner to avoid future incidents?
- Does PG&E have appropriate root cause analysis programs and methodologies?
- Are post-incident policies and actions meaningful and conducive to a positive safety culture?

⁵⁵ DR 203 Attachment 001

⁵⁶ Utility Procedure: GOV-6102P-03, Publication Date: 05/26/2015, Rev: 0 (DR 495 Attachment 004)

⁵⁷ Utility Procedure: GIV-6102P-05, Publication Date: 06/22/2016, Rev: 0 (DR 495 Attachment 006)

⁵⁸ DR 004 Supplement 001 Attachment 008

⁵⁹ DR 004 Supplement 001 Attachment 008

⁶⁰ DR 495 Attachment 001 (Utility Standard: SAFE-1004S, Rev:1, Publication Date: 05/31/2015)

⁶¹ DR 495

C. FINDINGS AND CONCLUSIONS

1. Incident and near hit reporting involves an assortment of systems, some of which were relatively recently developed.

- **Exhibit X-11** provides an overview of the various system used in corporate reporting and incident tracking. Additional discussion of each system is provided in **Appendix A**.

Exhibit X-11
Incident Reporting Systems

System	Owner	Deployment Date	Data	Notes
ROII	Corporate Safety	Pre-2013	<ul style="list-style-type: none"> • Employee Injury Data • MVI data • Near Hits • Electric Incidents 	<ul style="list-style-type: none"> • Retired with deployment of SEMS for injuries, MVIs and near hits in January 2014 after completion of SEMS 2013 releases (May for injuries, September for MVIs, and December for near hits) and ERE.
24/7 Nurse Report Line	Third Party data entry feeds SEMS	2012	<ul style="list-style-type: none"> • Employee injury data 	<ul style="list-style-type: none"> • The 24/7 Nurse Line was piloted by several organizations in 2012 and deployed to replace paper form injury reporting company-wide in January 2013. • An automated connection between the 24/7 Nurse Line and SEMS was established in June 2013.
SEMS	Corporate Safety	May 2013	<ul style="list-style-type: none"> • Injury data from Nurse Line with additional data entry • MVI data (web portal and mobile apps) • Near Hits (web portal, paper forms and phones) 	<ul style="list-style-type: none"> • SEMS near hit functionality became accessible company-wide in December 2013 with supporting communications in January 2014. • Gas Operations and DCPD continue to use CAP to report and track near hits. • As organizations deploy CAP, near hit reporting shifts to CAP. Any employee can enter near hits via SEMS, even if they have CAP available. Near hits submittals in SEMS will be disabled when all LOBs have access to CAP.
ERE/RINS	Safety and Human Performance	March 2013	<ul style="list-style-type: none"> • Electric T&D incidents, MVIs and injuries • Electric T&D Near Hits 	<ul style="list-style-type: none"> • Injury and MVI incidents were manually entered into ERE for purposes of tracking investigations and corrective actions. This information was duplicative and not always synchronized with SEMS. • Retired November 7, 2016. • Incidents and near hits are now

System	Owner	Deployment Date	Data	Notes
				entered in CAP. Injury and MVI investigations and corrective actions are also now tracked in CAP.
CAP	Enterprise CAP	1984 DCP 2013 Gas 2015 Safety and Shared Services 2016 Electric T&D and Power Gen 2017 all other LOBs (targeted)	<ul style="list-style-type: none"> Corrective Action Submittals such as equipment and safety issues, ineffective or inefficient work processes and procedures and improvement suggestions. Near Hits Injury and MVI investigation and corrective action data 	<ul style="list-style-type: none"> LOBs using CAP are instructed to enter near hits into CAP, but employees can still submit near hits via SEMS (see note above). Beginning in October 2016, SEMS and CAP were integrated to provide a single system for managing all investigations and corrective actions. For organizations supported by CAP, injury and MVI records are created based on SEMS data. Data from SEMS and CAP are integrated for purposes of performance reporting/analytics.

Source: Verification DR 881.

- SEMS is the system of record for all work-related injuries. It was developed in 2013 to replace the largely manual Report of Occupational Injury or Illness (ROII). SEMS tracks MVI and employee injury data and is used for OSHA reporting. SEMS reporting triggers a phone call to the 24/7 Nurse Report Line.⁶²
- Near Hits are reported in two systems – CAP and SEMS. Near hits were also tracked in ERE/RINS until it was retired in November 2016. Before it was retired, DCP and Electric T&D had to enter data in both SEMS and ERE/RINS.⁶³ Any employee can enter near hits via SEMS, even if they have CAP available. SEMS will be disabled for near hit reporting when all LOBs have access to CAP.⁶⁴
 - Gas Operations and Nuclear Generation use CAP to report near hits.⁶⁵
 - Near hits for Electric T&D were reported in RINS until November 2016 and are now reported in CAP.
 - Near hits for Generation, IT, Customer Care, and S&SS are reported in SEMS.⁶⁶
- Incident statistics are time dependent. Records are initially created by WorkCare (the 24/7 Nurse Report Line) and are updated as circumstances change. Any incident can have any number of updates resulting from either follow-up phone calls from the injured employee or from WorkCare nurses, or changes in the nature of treatment/status. These follow-ups can occur hours, days, weeks and even months

⁶² IR 45

⁶³ IR 45

⁶⁴ DR 881

⁶⁵ DR 004 Attachment 004

⁶⁶ DR 004 Attachment 004

following an initial incident/phone call. As such, information related to injuries changes over time, such as the number of lost work days or recurrences.⁶⁷

2. A variety of individuals, organizational groups and teams/committees are charged with review and analysis of the incidents and notifications generated by the various reporting systems, representing a significant level of investment in these systems and processes.

- Review teams analyze near hit submittals and assign a corrective action owner. The owner is to complete the corrective action and near hits are to be shared using-LOB specific methods or via the Near Hit Reporting intranet site.⁶⁸ The number of reported near hits is a KPI and reported on a monthly basis. Near hit notifications averaged about 56 per week during the 31-month period January 1, 2014 through July 31, 2016 (7,173 notifications over 134 weeks).⁶⁹
- Gas CAP notifications averaged 163 per week during the 33-month period, October 28, 2013 through July 25, 2016 (23,408 notifications over 143 weeks).⁷⁰ Within Gas Operations, CAP submittals were roughly 4,000 the first year, 10,000 the second year and 15,000 were expected the third year.⁷¹ Gas and S&SS CAP-related employee and IT costs totaled at least \$3.2 million in 2014 and \$9.0 million in 2015.⁷² There are many people devoted to CAP:
 - There are 17 full-time Gas CAP staff, one Sr. Director, 49 primary and back-up NRT members and 12 CARB members.
 - The S&SS CAP team includes 7 full-time staff, one Director, 6 primary CRT Members and 13 back-up CRT Members.
 - In early 2017, the ET&D CAP team consisted of 10 CAP staff, 16 CRT members, 4 CARB Chairs and 8 CARB members.⁷³
 - In early 2017, the Power Generation CAP team includes 7 CAP staff, 21 CRT members and 2 optional CRT members, and 11 CARB members.⁷⁴
 - When serving on the CAP Review Team, the NRT/CRT Members devote about 2 hours per day to the review and assessment of CAP items.⁷⁵
 - The Enterprise CAP Operations Group (7 full-time personnel) are responsible for program governance across the enterprise, perform enterprise-wide trend analyses, process enhancements, root cause analyses for significant events, and assist the LOBs with apparent cause evaluations.⁷⁶

⁶⁷ This is typical of reportable injury data as cases change status over time.

⁶⁸ DR 004 Supplement 001, Attachment 009

⁶⁹ DR 212 Supplement 002, Attachment 003–CONFIDENTIAL

⁷⁰ DR 214 Supplement 002, Attachment 001–CONFIDENTIAL and Attachment 002–CONFIDENTIAL

⁷¹ IR 90

⁷² DR 314 Attachment 001

⁷³ DR 882 Attachment 001

⁷⁴ DR 882 Attachment 001

⁷⁵ DR 218 Attachment 001

⁷⁶ DR 218 Attachment 001

- Additional LOB teams will be put in place as CAP is implemented throughout the organization.
 - There are 12 individuals responsible for SEMS and MVIs:
 - 3 Safety Data Coordinators
 - 2 MVI Review Team Members
 - 5 Members of the SH&E Planning and Governance Leadership are responsible for continuous improvement, systems and reporting, and analytics and benchmarking⁷⁷
 - 1 responsible for systems and admin testing
 - 1 SEMS IT Team member.⁷⁸
 - Eleven PG&E employees have dedicated or ancillary duties related to the 24/7 Nurse Report Line.⁷⁹
 - As of February 22, 2017, the SIF Review Teams consisted of the following members:⁸⁰
 - Electric T&D – 19
 - Non-nuclear Power Generation – 9
 - Gas Operations – 11
 - S&SS – 12
 - Motor Vehicles – 4
 - Customer Care – 21 (in Q2 – 2017)
 - IT - 5
 - Various field organizations analyze safety data to identify improvement opportunities specific to their districts/divisions or offices.⁸¹
- 3. The 24/7 Nurse Report Line facilitates early reporting and may serve to minimize the severity of injuries; however, additional monitoring/modification would promote an improved user experience, higher data quality and sustained use.**
- The purpose of the 24/7 Nurse Report Line is two-fold: 1) it serves as the data entry portal for all injuries, and as such is necessary for OSHA and other reporting; and 2) to provide early intervention by offering immediate access to a nurse or doctor at the time of work-related injury.

⁷⁷ DR 004 Attachment 004

⁷⁸ DR 218

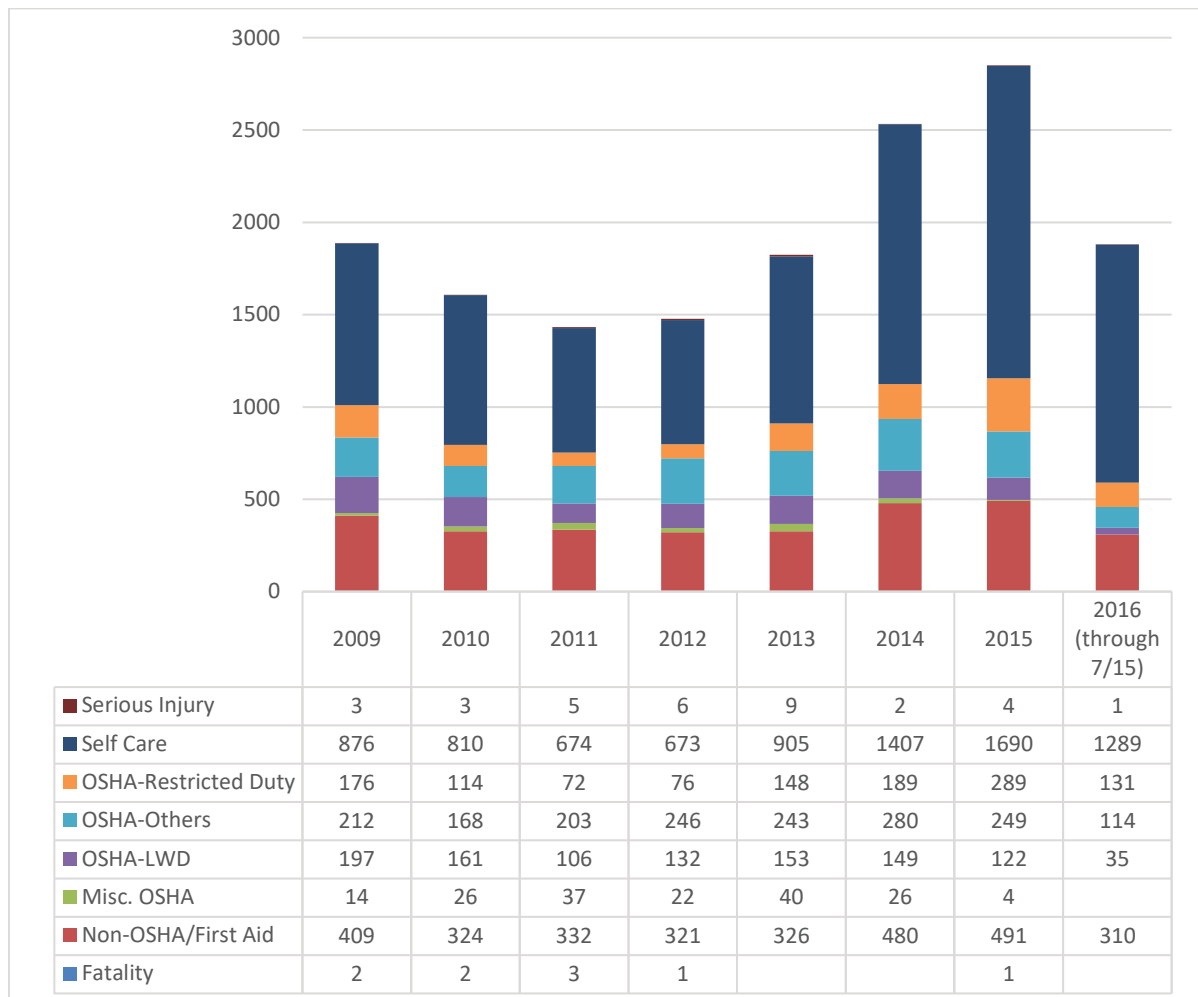
⁷⁹ DR 218

⁸⁰ DR 882 Attachment 002

⁸¹ Various interviews

- Employees are required to report injuries within 24 hours of their identification or occurrence. Timely reporting of injuries was added as a STIP metric in 2016.⁸² Timely reporting increased from 61 percent in 2015 to 66.6 percent YTD in 2016.⁸³
- Likely as a result of the change in the disciplinary policy and the promotion of the 24/7 Nurse Report Line, injury reporting has increased, as shown in **Exhibit X-12**.

Exhibit X-12
PG&E Incidents (2009 – July 15, 2016)



Note: All fatalities are in Electric T&D. Of the 33 serious injuries during the period from 2009 through July 15, 2016, 18 were in Electric T&D, 3 in Customer Care, 8 in Gas Operations and 4 in Generation.

Source: DR 301, Attachment 001

- PG&E claims that employees who report injuries within 24 hours experience 40 percent less lost time on average (for lesser severity injuries).⁸⁴ As the raw data and

⁸² DR 004 Attachment 008

⁸³ DR 725 dated December 6, 2016

computations are not available, NorthStar cannot validate PG&E's claim or assume a direct tie to the 24/7 Nurse Report Line. A number of other programs could contribute to the results.

- PG&E's statement is based on a consultant's analysis of PG&E 24/7 Nurse Report Line Timeliness and Workers' Compensation Claim Duration, dated September 2016.
 - According to PG&E, source data is not available for this analysis. The consultant manages a data warehouse for PG&E. The consultant is provided data on PG&E employees from a number of sources.
 - Much of this data is protected, and cannot be provided to PG&E. At PG&E's request, the consultant performs analysis using this data, providing results to PG&E in a manner that prevents identification of individuals.⁸⁵
- Although anecdotal, NorthStar interviews with field and office employees provide mixed reviews regarding the 24/7 Nurse Report Line. Some consider it to be beneficial from an early intervention standpoint, some view it merely as a replacement of the prior "pink slip" reporting process, while others question the value as the advice is always "ice and ibuprofen."⁸⁶ Others expressed frustration with wait times, the professionalism of the third-party administrator, or their supervisor or another PG&E employee calling on their behalf.⁸⁷ If employees view the system as having limited value they may either disregard advice or not report what they perceive to be a minor injury.
 - An outside vendor, WorkCare, is the administrator of the 24/7 Nurse Report Line. WorkCare is an occupational health care company owned by a team of board-certified occupational health physicians. Intake Coordinators are not licensed physicians or medical nurses. For care, an employee will be transferred to a nurse or physician, following intake.⁸⁸ A PG&E Program Manager coordinates interactions between the WorkCare vendor and PG&E.⁸⁹ The contract with WorkCare requires reporting on the following performance metrics:⁹⁰
 - Call wait time
 - Call abandonment rate
 - Customer satisfaction
 - Clinic referrals
 - E-mail notifications – self care

⁸⁴ DR 831 and Attachments. According to the consultant's presentation: "Prior [consultant] analytics have not found evidence to support this hypothesis. However, those prior analytics were performed at the group-level making it difficult to control for severity. More severe injuries are both reported more quickly and result in more LWDs."

⁸⁵ DR 831

⁸⁶ Various interviews, meetings and field visits

⁸⁷ Various interviews, meetings and field visits, DR 632 Attachment 002

⁸⁸ DR 629 and DR 630

⁸⁹ DR 630

⁹⁰ DR 631

- E-mail notifications – clinical visits
 - Case accuracy
 - Quality of care
 - Account management
 - Account support.
- In February 2015, PG&E instructed WorkCare to begin conducting a twice weekly audit to identify case file errors and associated resolutions. These audits are currently reported weekly. As shown in **Exhibit X-13**, error rates are greater than 25 percent. Examples of errors include: missing self-care suggestions, missing injury location, and causes of incidents that don't make sense. PG&E is in the process of developing its own audit process.

Exhibit X-13
WorkCare Audit Results

Type	2/19/15 – 12/31/15	1/1/16 – 9/28/16
Number of Calls with Issues Identified	646	745
Total Number of Calls	2,431	2,618
Percent of Calls with Issues	26.57%	28.45%

Source: DR 632.

- PG&E also receives monthly and quarterly 24/7 Nurse Report Line customer satisfaction survey results.⁹¹
 - Based on the survey results the majority of employees are generally satisfied with the process (78 percent strongly agree or agree); 16 percent disagreed or strongly disagreed.

Exhibit X-14
WorkCare Satisfaction Results
January – August 2016

Question	Strongly Agree	Agree	N/A	Disagree	Strongly Disagree	(blank)
The clinician was knowledgeable about my condition	35%	43%	6%	11%	3%	1%
I received follow-up calls from the clinician as scheduled	38%	30%	19%	7%	6%	1%
The clinician educated me on all of my options including self-care versus a doctor visit.	37%	35%	10%	11%	5%	2%
Overall, I was satisfied with the services provided by WorkCare	40%	38%	4%	7%	9%	1%

Source: DR 632 Attachment 002

- Follow-up calls are made to employees who reported high dissatisfaction.

⁹¹ DR 632

- PG&E recently held focus group sessions with survey respondents. One held in October 2016 and one scheduled for November 2016 were intended to obtain direct and more detailed feedback on the successes and improvement opportunities for the 24/7 nurse report line service.
 - PG&E states that survey questions will be enhanced, but it is not clear that PG&E has effectively managed improvements to the program over its six-year implementation.
- 4. PG&E has, or is implementing, confidential reporting systems in the form of near hits and CAP throughout the organization; however, implementation will not be complete until 2017. Indications are that employees generally feel comfortable using the systems, but field use may be relatively low, and it is unclear whether CAP has moved the needle on safety.**
- According to PG&E's current schedule, CAP will be available throughout the utility by July 2017. **Exhibit X-15** provides implementation dates for each LOB.

Exhibit X-15
CAP Implementation Timeline

LOB	Date of CAP Rollout
Nuclear Generation	1984
Gas Operations	October 2013
Safety and Shared Services	October 2015
Power Generation	July 2016
Electric T&D	October/November 2016
IT	April 2017
Customer Care and all other LOBs	April/June 2017

Source: IR 090, DR 061 Attachment 001, DR 512, DR 724 Attachment 001.

- According to PG&E, the objective of CAP is to provide employees with a voice. Ideally it will: ensure that issues are documented and addressed; allow PG&E to learn from issues so it can prevent them from happening again; and, reduce the overall risk of operations.⁹²
- As implemented in Gas Operations, CAP is intended to be all inclusive. No issue is considered too big or too small. Employees are instructed to document all issues in CAP, and when in doubt enter it in CAP.⁹³ "Some issues will be investigated to identify the cause and actions taken to prevent their recurrence. Many others will be evaluated and resolved. Every CAP entry brings us closer to being able to identify problems before they have a significant impact."⁹⁴
- PG&E uses CAP to track the results of SED audits and other items. As a result, a few users have input many of the CAP items. Gas CAP employee participation levels

⁹² DR 061 Attachment 002, May Orientation Presentations (IR 14)

⁹³ DR 274 Attachment 001 and 006 - CONFIDENTIAL

⁹⁴ DR 274 Attachment 005 CAP Newsletter Issue 1

steadily increased during the first part of 2016, from 9.5 percent in January to 31.1 percent in June.⁹⁵

- In August 2014, Gas Operations' Strategy and Process Excellence team conducted a user satisfaction survey (initiators, issue owners and action owners) about the effectiveness of CAP within Gas Operations. Seventy-six percent agreed or strongly agreed with the statement that "I am comfortable entering any issue in CAP, regardless of how big or small."⁹⁶ **Exhibit X-16** provides the survey results. The NRT was formed to address issues identified by the survey.⁹⁷

Exhibit X-16 **CAP Survey Results – Gas Operations**

Survey Question	Percent		
	Agree or Strongly Agree	Neither Agree or Disagree	Disagree or Strongly Disagree
I am comfortable entering any issue in CAP, regardless of how big or how small	76%	13%	11%
I report all known Near Hits in CAP	42%	46%	12%
CAP is an effective way to resolving issues	45%	34%	22%
I receive adequate feedback on issues I have submitted	33%	29%	39%
I check the status of issues I submit in CAP	50%	25%	25%
It is easy to report an issue in CAP	79%	10%	11%

Note: An initial criticism of CAP was that items were assigned to the initiator for resolution. PG&E refers to this as the boomerang effect. This was subsequently corrected.

Source: DR 274 Attachment 007.

- Although anecdotal, NorthStar's field visits and interviews do not point to extensive use of CAP or Near Hit reporting in the field.⁹⁸
- CAP allows employees to report anonymously. The extent of anonymous reporting is generally low, and the number of submissions has generally increased until recently. **Exhibit X-17** shows the monthly submissions in Gas CAP and the corresponding number of anonymous submissions.

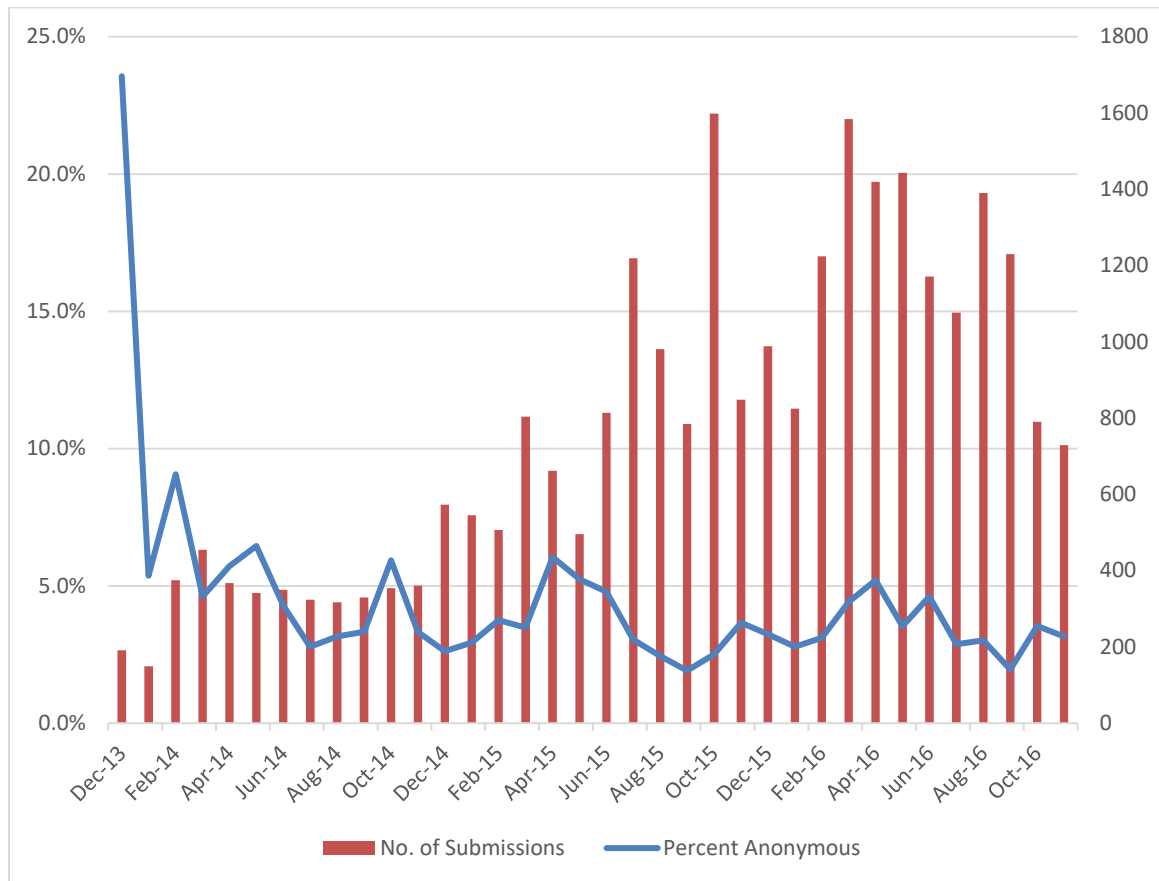
⁹⁵ DR 438 Attachment 003

⁹⁶ DR 274 Attachment 007

⁹⁷ DR 274 Attachment 007

⁹⁸ Various field interviews and site visits

Exhibit X-17 Gas CAP Submission and Anonymous Submissions



Note: According to the PG&E, the increase in the number of anonymous submissions in March and April 2016 can be attributed to the push to get field-based employees to install the CAP app and submit CAP items (DR 214 Supplement 004 Attachment 001).

Source: DR 726 Attachment 006.

- S&SS CAP submittals have generally increased since rollout in October 2015 and anonymous reporting has declined, as shown in **Exhibit X-18**. Specific counts vary based on the information provided to NorthStar in different data responses.

Exhibit X-18 S&SS CAP Utilization

Month	No. of Notifications/ Submissions [Note 1]	No. of Notifications/ Submissions [Note 2]	Anonymous		
			Number [Note 2]	Percent [Note 1]	Percent [Note 2]
October 2015	22	19	5	22.7%	26.3%
November 2015	63	63	9	14.3%	14.3%
December 2015	120	120	19	15.8%	15.8%
January 2016	57	57	5	8.8%	8.8%

Month	No. of Notifications/ Submissions [Note 1]	No. of Notifications/ Submissions [Note 2]	Anonymous		
			Number [Note 2]	Percent [Note 1]	Percent [Note 2]
February 2016	176	177	13	7.4%	7.3%
March 2016	216	227	9	4.2%	4.0%
April 2016	240	197	7	2.9%	3.6%
May 2016	217	219	10	4.6%	4.6%
June 2016	180	No data	No data		
July 2016	167	No data	No data		

Note 1: Based on DR 214 Supplement 002, Attachment 005. Sorted by Initiation Date and counted.

Note 2: Taken from DR 225 Attachment 002

Source: DR 214 Supplement 002, Attachment 005 – CONFIDENTIAL.

- Each LOB awards a monthly “Eagle Eye” award to someone who has submitted or corrected a notable issue through CAP.⁹⁹ As examples:
 - A senior gas distribution engineer spotted 175 service lines that were copper, but weren’t included in the Copper Service Replacement Program (CSRP). She reported her observations in CAP to create a record and ensure that the issue would be thoroughly evaluated. After the assigned team looked into it, the service lines were correctly classified as copper, added to the CSRP schedule and replaced before the program concluded.¹⁰⁰
 - In February 2014, a Supervising Engineer submitted an item into the CAP identifying the fact that a school lacked the dual regulators required for all schools and public assembly locations as per H-15 and that the service for the school is not on the required plat map, thus is likely not being surveyed annually. PG&E converted the set to a dual head regulator.¹⁰¹

5. Other than an overall increase in safety awareness, it has yet to be proven whether the Near Hit Reporting process will contribute to meaningful and constructive safety improvements.

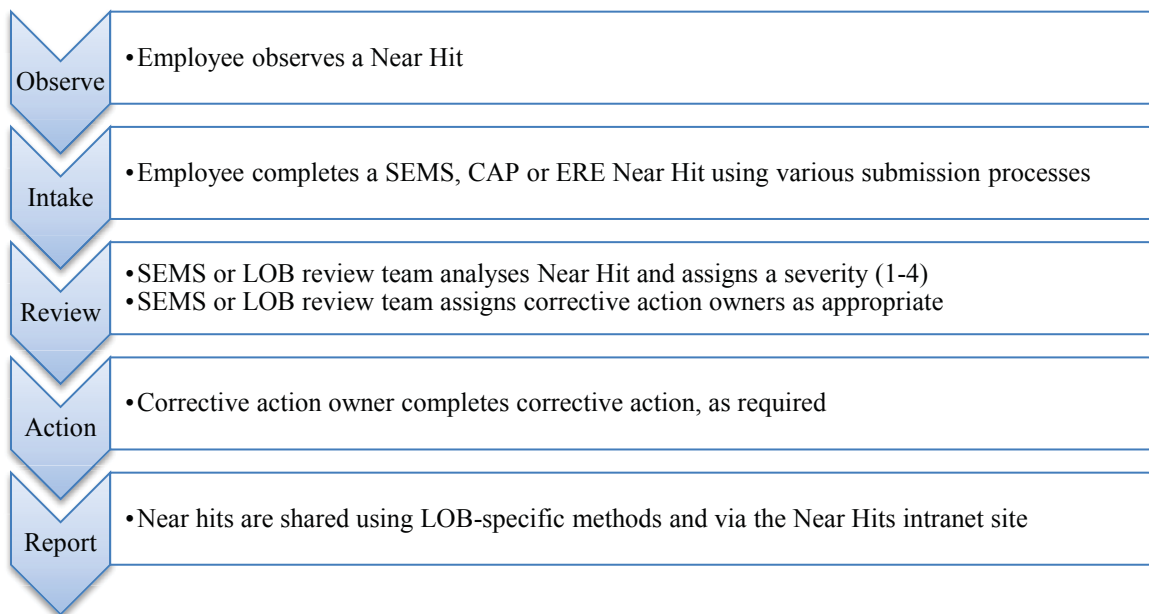
- Near hits are identified by employees, reviewed and analyzed according to the following process.

⁹⁹ DR 061 Attachment 007, DR 274 Attachment 005 - 011 (CAP News). Attachments 006, 008, and 009 are CONFIDENTIAL.

¹⁰⁰ DR 274 Attachment 005

¹⁰¹ DR 274 Attachment 005

Exhibit X-19 Near Hits Resolution Process



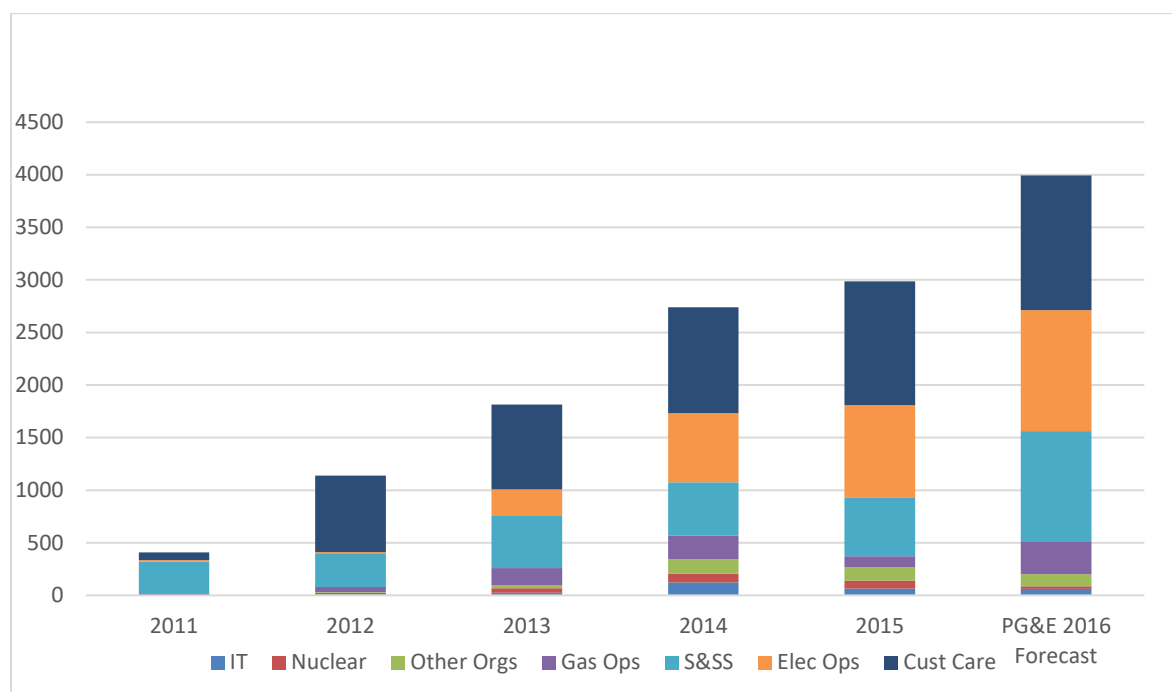
Source: DR 004 Supplement 001 Attachment 009.

- In order to increase near hit and safety awareness, PG&E has decided to include near hits that happened at work and outside of work in the database.¹⁰²
- The inconsistent reporting of near hits (all field operations) was supported by discussions during NorthStar's field visits.¹⁰³
- Although there are inconsistencies in PGE's reporting of data, as shown in **Exhibit X-20**, near hit reporting has increased over time.

¹⁰² DR 212 Supplement 002 Attachment 003 - CONFIDENTIAL

¹⁰³ Various field observations and interviews

Exhibit X-20
Annual Near Hit Reporting by LOB
(SEM, ERE, CAP, ROI)



Source: DR 726 Attachment 005, DR 878.

- Very few of the near hits are considered high risk. **Exhibit X-21** provides a breakdown by severity level.
 - Of the 7,173 near hits recorded from January 1, 2014 through July 31, 2016, only 72 were classified as Severity Level 1 (1% of the total).¹⁰⁴ These are considered the highest risk.
 - 945 incidents were Severity Level 2 – 13.2% of the total.

Exhibit X-21
Reported Near Hits by Severity Level

Severity Level	Count					Percent			
	2014	2015	2016 (7 mo.)	Total		2014	2015	2016 (7 mo.)	Cum Total
1	28	30	14	72		1.2%	1.1%	0.6%	1.0%
2	520	299	126	945		22.8%	11.1%	5.7%	13.2%
3	401	556	621	1,578		17.6%	20.7%	28.3%	22.0%
4	1,335	1,805	1,408	4,548		58.5%	67.1%	64.1%	63.4%
N/A		1	29	30		0.0%	0.0%	1.3%	0.4%
Total	2,284	2,691	2,198	7,173					

Source: DR 212 Supplement 002 Attachment 003 – CONFIDENTIAL.

¹⁰⁴ DR 212 Supplement 002 Attachment 003 - CONFIDENTIAL

- Of the total, 4,548 incidents were Severity Level 4 – 63.4% of the total. These are considered the lowest risk and are closed without any further action.¹⁰⁵
- 1,578 incidents were Severity Level 3 – 22.0% of the total. These are also considered low risk but a corrective action is typically recommended by the reporting employee. Also, the employee’s supervisor is typically informed of the near hit notification and closes it with or without action, but mostly without action.¹⁰⁶ Causal evaluations are not required for Severity Level 3 near hits.¹⁰⁷
- 30 incidents were not assigned a severity level – 0.4% of the total.
- Severity Level 1 items typically require a SIAP and a causal evaluation.¹⁰⁸ Severity Level 2 items are considered medium risk and typically result in a SIAP.
 - 27 of the 72 Severity Level 1 Near Hits in Exhibit X-21 did not have a SIAP or root causes analysis (37.5%).¹⁰⁹
 - 225 of the 945 Severity Level 2 Near Hits in Exhibit X-21 did not have a root cause analysis (23.8%).¹¹⁰
 - In response to NorthStar’s inquiry regarding why these near hits did not have an assigned root cause analysis, PG&E segmented these into two groups (240 near hits from 2014 and 12 near hits post-2014) and provided the following explanation:¹¹¹
 - In 2014, a system defect and immaturity of the manual SEMS gatekeeper function allowed items to be closed without an investigation summary if at least one corrective action had been completed. Others were immediately closed and should not have been assigned a Level 2 Severity.
 - For the remaining twelve near hits, seven had a causal analysis entered after the information was submitted to NorthStar. The other five near hits were closed, which may be the result of an ongoing system defect.
- While too cumbersome to quantify and document, there are likely hundreds of reported incidents that do not rise to the actual definition or true intention of a near hit (an incident that occurred that did not cause injury but could have). **Exhibit X-22** provides some examples.

¹⁰⁵ DR 212, Supplement 002 Attachment 003 - CONFIDENTIAL

¹⁰⁶ DR 212, Supplement 002 Attachment 003 - CONFIDENTIAL

¹⁰⁷ DR 879

¹⁰⁸ DR 212, Supplement 002 Attachment 003 - CONFIDENTIAL. NorthStar cannot confirm that all Severity Level 1 and 2 have a SIAP as the data field is blank in some instances – 27 of the 72 Severity Level 1 and 233 of the Severity Level 2 were blank.

¹⁰⁹ DR 212, Supplement 002 Attachment 003 - CONFIDENTIAL

¹¹⁰ DR 212, Supplement 002 Attachment 003 - CONFIDENTIAL

¹¹¹ DR 879

Exhibit X-22
Samples of Near Hits Reported – Severity Level 4

Incident No	Incident Initial Description
10041751	At least once a month I would spend my Sunday afternoon at a Target Store. I noticed there were 2 plastic hangers on the floor. Most customers, I noticed were trying to avoid or ignore those plastic hangers.
10051172	I almost collided with a coworker in the break room. I was walking into the break room and the coworker was walking out with a hot cup of coffee.
10042405	Every morning, I walk from Mission St to the 77 Beale entrance, passing along the front side of the building. And every morning I have to dodge the cigarette smoke from a multitude of PG&E employees who choose to smoke in front of our building. The fact that cigarette smoke is unhealthy cannot be challenged, and it is disappointing that I have to walk through it every single day. It is also highly disappointing that the smokers also litter by tossing their used cigarette butts on the ground.
10038330	I was in the women's bathroom at the gym and as I was walking to the sink, I stepped on something and started to slide but I didn't fall. I looked down on the floor and there was a hair curler.
10042062	As I was about to enter an elevator door someone was walking out the elevator door. That person was texting and walking and almost walked into me.
10041503	Ordered a cup of Soup from Sprig Cafe. Cup was not adequate enough to handle the heat of the soup without a sleeve. Used a napkin to compensate for the heat. While walking back to the building soup spilled on my hand and burned my index finger.
10042864	While waiting for the doors to the exercise room to be unlocked for the "Open Barre" class during lunch hour an employee dropped her water bottle spilling water onto the floor.
10041340	A colleague's car window was broken and a friend's purse was stolen out of the back seat.
10036525	During our Service Anniversary luncheon. I was sitting at the end of the table and noticed the waiter had spilled a fair amount of water on the floor.
10045837	During my commute to a job, I found a discarded sofa chair on the right side of the road.
10054772	Home in very poor shape and very dirty.

Source: DR 212.

- NorthStar selected a small sample of Near Hit Severity Level 1 items which generated a causal analysis.¹¹² The information in SEMS contains limited detail on root causes or corrective actions taken. In some cases, it is difficult to tell how the issue or defect was resolved and whether broader enterprise-wide issues were addressed.¹¹³ Documentation is relatively poor.¹¹⁴
 - The corrective action documentation in SEMS is confusing and repetitive. In some cases, it is unclear what actions were taken to address and close-out the issue.
 - Incidents (near hits and injuries) that rise to the level of an apparent cause evaluation include better information regarding the corrective actions taken, as formal reports are prepared. Beginning in 2017, corrective actions must be included for STIP/LTIP tracking purposes.¹¹⁵ The ACE still contains no

¹¹² 45 Near Hit Severity Level 1 items had a SIAP and causal evaluation. NorthStar reviewed 9 of the 45.

¹¹³ Review of DR 756 and subsequent follow-up

¹¹⁴ NorthStar Analysis based on review of DR 756 and subsequent follow-up

¹¹⁵ Review of follow-up to DR 756 (ACE – May 27, 2014)

information on completion dates, broader communications, or whether the corrective actions were effective.¹¹⁶

- Corrective action documentation for minor injuries and near hits (which result in a WGE) is much less robust than for those which require either an RCE or an ACE.¹¹⁷

6. The defined level of rigor associated with the causal evaluation process has increased as a result of the Kern Settlement Agreement. However, additional rigor is required in the documentation/demonstration of corrective actions and how they are implemented. Greater consistency between all procedures is also warranted.

- On June 19, 2012, a PG&E subcontract construction worker was injured and subsequently died during the demolition of an unused fuel oil tank at the decommissioned Kern Power Plant. In August 2014, SED filed its investigation report finding multiple deficiencies in PG&E's processes, including PG&E's failure to submit a timely and comprehensive root causes analysis to the Electric Safety and Reliability Branch (ESRB) of the CPUC.¹¹⁸ In D. 15-07-014, the Commission approved a Settlement Agreement related to the June 19, 2012 incident.¹¹⁹
- Among other things, the Settlement Agreement required PG&E to implement an Enterprise Causal Evaluation Standard, designed to achieve five main objectives:¹²⁰
 - Provide enterprise-wide guidance for evaluating the cause of serious incidents including: when to do an evaluation; what type to do; what people are necessary to the evaluation team; what evaluative methods should be used; a clear understanding of the evaluation's purpose; and a process for meaningfully disseminating the results of the evaluations.
 - Apply the evaluation standards to near hits.
 - Develop a training plan for those people engaged in causal evaluations, including training on the fundamentals of causal evaluation.
 - Develop a detailed causal evaluation guidance tailored to each LOB.
 - Establish a Cross Functions Causal Evaluation Review Committee to review root cause evaluation reports on trends and performance. The Committee is also to validate compliance with the Enterprise Causal Evaluation Standard and identify

¹¹⁶ NorthStar Analysis, review of follow-up to DR 756 (ACE – May 27, 2014)

¹¹⁷ DR 756 and follow-up response.

¹¹⁸ August 2014, Investigation Report of the June 19, 2012 Fatality at the Kern Power Plant Owned by Pacific Gas and Electric Company, prepared by the Safety and Enforcement Division Electric Safety Reliability Branch.

¹¹⁹ Decision 15-07-014, dated July 23, 2015 in I.14-08-022 OII on the Commission's Own Motion into the Operations and Practices of Pacific Gas and Electric Company; Notice of Opportunity for Hearing; and Order to Show Cause Why the Commission Should Not Impose Fines and Sanctions for the June 19, 2012 Incident at the Kern Power Plant.

¹²⁰ Kern Settlement Agreement

areas for improvement.¹²¹ The Committee was to be established and the procedures implemented by the end of 2015.

- D.15-07-014 approved a draft of PG&E’s Enterprise Causal Evaluation Standard. On May 11, 2015, and consistent with the approved draft, PG&E published its Enterprise Causal Evaluation Standard (Utility Standard: GOV-6102S).¹²²
 - This standard is applicable to Serious Safety Incidents determined to be life threatening, life-altering, or fatal to the public, employees or contractors resulting from work on or caused by a failure or malfunction of PG&E facilities. An RCE is required for all Serious Safety Incidents.
 - For other safety incidents, including injuries, work-related illnesses, significant property damage or “near hit” incidents, Management shall use a systematic approach to evaluate whether to perform an RCE or other Causal Evaluation method, taking into account the potential for the incident to have been more serious and the likelihood of recurrence. The systematic approach shall be defined in the implementing procedures for each LOB.
- The Enterprise Causal Evaluation Standard (referred to in this report as the Kern Standard) differs from PG&E’s Serious Safety Incident Investigation Standard (Utility Standard: SAFE-1004S, Publication Date: 05/31/2015, Rev: [1])¹²³ NorthStar is unclear as to why these differences are appropriate.
 - The Serious Safety Incident Investigation Standard addresses the serious safety incidents that are included in the Kern Standard, but also applies to an injury involving hospitalization in excess of 24 hours for other than observation, or a loss of any part of the body (including an eye) or any serious degree of permanent disfigurement.¹²⁴
 - The Serious Safety Incident Investigation Standard does not describe the type of causal evaluation required for any event.
 - The two standards have different communication protocols.
 - The Kern Standard communication protocol requires a preliminary (limited) internal communication (within 48 hours), an Interim Report at 60 days and a Presentation of Findings & Corrective Actions to LOB Leadership at 90 days.
 - The Serious Incident Investigation Standard requires an email to all employees within 24 hours, an Interim Report at 30 days, a Presentation of Findings & Corrective Action to LOB Leadership at 45 days, and a closing email to all employees at 60 days.¹²⁵

¹²¹ D.15-07-014, pp. 11-12.

¹²² DR 203 Attachment 001, D.15-07-014

¹²³ DR 495 Attachment 001

¹²⁴ DR 203 Attachment 001, DR 495 Attachment 001

¹²⁵ NorthStar has seen no evidence of these all employee final communications and thus cannot confirm compliance with the procedure (DR 066 and all Attachments, DR 066 Supplement 001 and all Attachments)

- Roles and responsibilities are more extensively defined in the Kern Standard. The list of definitions is also greater.
 - The Kern Standard Process Timeline does not include steps for follow-up on the Effectiveness Review Plan or the completion of the Corrective Actions. The Serious Incident Investigation Process Flow requires Corrective Action Validation and a Final Report and Effectiveness Evaluation to be provided to the Casual Evaluation Committee at 180 days.
- In what appears to be recognition of the inconsistencies in the time requirements specified in the two standards, PG&E updated the Serious Safety Incident Investigation Standard (and renamed it). The current version is Rev:1, Publication Date 1/6/2016.¹²⁶ While this made the communication timeline consistent with the Kern Standard, it introduced other problems, as shown in **Exhibit X-23**.

Exhibit X-23
Enterprise Procedure Comparison

Item	Utility Standard: GOV-6102S Publication Date: 5/11/2015, Rev: 0	Utility Standard: SAFE-1004S Publication Date: 05/31/2015, Rev: [1]	Utility Standard: SAFE-1004S Publication Date 1/6/2016 Rev: 1
Applicable injuries	Serious Safety Incidents determined to be life threatening, life altering, or fatal to the public, employees or contractors resulting from work on or caused by a failure or malfunction of PG&E facilities		
Required CE	RCE	No specific type of CE required – refers to GOV-6102S	
Applicable injuries		An injury involving inpatient hospitalization for a period in excess of 24 hours for other than medical observation	
Required CE		No specific type of CE required – refers to GOV-6102S	
Applicable injuries		A loss of any part of the body (including eye), or any serious degree of permanent disfigurement (includes tissue damage without loss of bone)	
Required CE		No specific type of CE required – refers to GOV-6102S	
Definitions	More extensive	Less extensive	
Process Flow/Timeline Included	Yes Ends when report sent to shareholders	Yes Ends with Validation (Effectiveness Evaluation)	Eliminated Process Flow
Communication Timeline			
Preliminary Internal All Employee Email		Within 24 hours	Within 24 hours
Preliminary (Limited) Internal Notification (higher org levels)	Within 48 hours		Within 48 hours
Interim Report (Limited)	Within 60 days		Within 60 days
Final Limited Report		Within 30 days	

¹²⁶ DR 757 Attachment 001

Item	Utility Standard: GOV-6102S Publication Date: 5/11/2015, Rev: 0	Utility Standard: SAFE-1004S Publication Date: 05/31/2015, Rev: [1]	Utility Standard: SAFE-1004S Publication Date: 1/6/2016 Rev: 1
Presentation of Findings and Corrective Actions (Executives)	Within 90 days	Within 45 days	Within 90 days
Final All Employee Email		Within 60 days	

Source: DR 203 Attachment 001, DR 495 Attachment 001, DR 757 Attachment 001.

- There are differences between the LOB procedures that do not appear to be related to operational differences.¹²⁷ As an example, the Power Generation Procedure includes a discussion of the WGE process, while the Electric T&D and Gas Operations procedures do not. Gas Operations procedures do not include an RCE process timeline and appear to group RCE and ACE.
- According to PG&E, a Cross Functional Causal Evaluation Review Committee was established in 2015, as required by the Kern Settlement Agreement. It meets quarterly (or more frequently as needed) to review RCE reports to identify enterprise-wide trends and monitor performance of RCEs. The Committee is chartered with determining if the RCEs are in compliance with the standard, identify opportunities for improvements in cause evaluation performance and determine if additional communications of lessons learned is required.¹²⁸

7. Although PG&E has performed causal evaluations for many years, the processes have not been integrated throughout the organization in a manner which would best facilitate and promote consistent safety efforts.

- NorthStar reviewed a sample of casual evaluations from ET&D (2010, 2011, 2012), Gas Operations (2013, 2014, 2015, 2016) and Power Generation (2012, 2013, 2014, 2015).¹²⁹ The causal evaluations vary considerably in terms of their structure and format.
- Causal analyses were relatively detailed in terms of the investigation, identification of root causes and recommendations.¹³⁰ Although the format, structure and length vary by LOB, the reports are thorough, comprehensive, conclusive and list corrective actions and next steps. The reports generally include the following:
 - Background, summary of the incident or problem statement
 - Detailed description of the incident
 - Photographs, calculations, drawings, timelines and other depictions relevant to the event
 - Root cause analysis methodology employed

¹²⁷ DR 495 Attachments 002-008

¹²⁸ DR 495 Attachment 009 Cause Evaluation Committee Charter. NorthStar did not attend any of these meetings.

¹²⁹ NorthStar review of casual evaluations provided in DR 495 - CONFIDENTIAL

¹³⁰ NorthStar Review of Causal Analyses (DR 495, 496) - CONFIDENTIAL

- Applicable rules and procedures
 - Event analysis including event factors, root cause and contributing causes
 - Corrective actions and recommendations.¹³¹
- Some include notes from interviews conducted; others do not. Some include the training and safety history of the crew.¹³² NorthStar's review of causal evaluation reports found that:
 - Most did not consistently assign accountability or include corrective action timelines.
 - The reports themselves do not provide information as to how and by whom the causal analysis was assigned, how the analytical team was chosen, who owns the report, etc.
 - The reports also do not present how information, findings and recommended actions will be communicated throughout the organization. Frequently they refer an employee to the intranet site.
 - The reports do not all assign accountability for outstanding corrective actions.
 - NorthStar was not provided with project close-out materials which would indicate what steps were taken and lessons learned.
 - Until required by the Kern Settlement, there was no standardized structure or framework in which causal analyses were determined, initiated and conducted within PG&E. That is, events could be and were evaluated to determine next steps (causal analysis), initiated, conducted, completed and implemented through a somewhat indeterminate and inconsistent process.
 - The varying report structures illustrate the extent to which safety efforts are not tied together in an integrated manner in order to make the processes more accessible, understandable, consistent and accountable.¹³³
- 8. The level of rigor applied to causal analysis should change as a result of the Kern Settlement and the recent reorganization of Corporate Safety Field Operations; however, it is too soon to confirm improvement.**
- Causal evaluation teams are typically staffed with multiple, higher-level, experienced employees.
 - Roles include team leads, subject matter experts, safety investigators, incident analysis leads, legal support and CAP investigators.¹³⁴
 - PG&E position titles involved in the causal analysis process include directors, superintendents, supervisors, attorneys, WGE specialists, training instructors, CAP specialists and quality assurance engineers.¹³⁵

¹³¹ NorthStar Review of Causal Analyses (DR 495, 496) - CONFIDENTIAL

¹³² NorthStar review of casual evaluations provided in DR 495 - CONFIDENTIAL

¹³³ DR 495 - CONFIDENTIAL and DR 496 - CONFIDENTIAL

¹³⁴ NorthStar Review of Causal Analyses (DR 495 - CONFIDENTIAL)

- PG&E provides training and certification in causal analysis. While certification is not required in order participate in the causal analysis process, training and certification is preferred and available.
- More recent causal evaluations result in corrective actions with assigned owners and due dates.¹³⁶ Corrective actions are required to be tracked; however, only one incident provided to NorthStar included evidence of this tracking.¹³⁷ Corrective actions include such items as safety stand downs, procedure modification/update, tailboards, updated JSAs/JSSAs, changes in the use of tools, new or revised training and communications to affected employees.¹³⁸ However, NorthStar found no evidence of good lessons learned sharing across the organization.
- Effectiveness reviews/evaluations should be performed upon completion of the corrective actions.
- Significant causal evaluation findings are discussed at the respective LOB Safety Councils and may be presented at the Enterprise Safety and Risk Committee if they are determined to have potential interest/implications throughout the organization.¹³⁹
- As a result of a recent reorganization, Corporate Safety Field Operation will have 6 Incident Investigators (3 Expert, 2 Senior and 1 Career) reporting to an Incident Investigation Manager. These individuals will assist the LOBs in incident investigations, provide subject matter expertise and lead the causal evaluation.¹⁴⁰

9. As the SIF Prevention Program will not be rolled out to the field until 2017,¹⁴¹ NorthStar cannot determine the effect this may have on mitigating serious injuries or the potential effect on less serious injuries.

- The intent of the SIF Prevention Program is to focus on mitigating the incidents with the greatest potential for significant injury.¹⁴² Despite the significant number of PG&E MVIs, they were not part of the initial SIF Prevention Program.
- Each LOB staffs and operates a cross-functional SIF Review Team, which conducts weekly reviews of SEMS data, CAP and near hits to identify SIF Potentials. There are eight SIF teams representing the various LOBs, including Electric T&D, Power Generation, DCP, Gas Operations, S&SS, IT, Motor Vehicles and Customer

¹³⁵ NorthStar Review of Causal Analyses (DR 495 - CONFIDENTIAL)

¹³⁶ NorthStar Review of Causal Analyses (DR 156, 495, 496) All CONFIDENTIAL

¹³⁷ NorthStar Review of Causal Analyses (DR 156, 156 Supplement 001) DR 156 Attachment 002 is CONFIDENTIAL

¹³⁸ DRs 156, 407, 429, 495, 496. DR 156 Attachment 002 is CONFIDENTIAL. DR 407 Attachments 003 and 006 are CONFIDENTIAL

¹³⁹ Attendance at July 22, 2016 Gas Safety Council (materials provided in DR 407), October 5, 2016 Safety and Risk Committee. DR 407 Attachments 003 and 006 are CONFIDENTIAL

¹⁴⁰ DR 463 Attachments 004 and 005

¹⁴¹ DR 724

¹⁴² DR 004 Attachment 004, Orientation Presentation

Care.¹⁴³ Each team is composed of staff members from varying parts of the organization, but also typically includes positions with direct participation in, or ownership of, safety. For example, the Electric T&D SIF Review Team is staffed with the Manager of Safety and Human Performance, the Electric T&D Safety Leadership Support Manager and the Senior Electric Safety Compliance Specialist.

- In 2015, PG&E's focus was on the review of historical events.¹⁴⁴ These included field observations, injuries, potential SIF and Near Hits.
 - Power Generation analyzed 90 cases – 38% (2 injuries and 32 Near Hits) were identified as having SIF exposure.¹⁴⁵
 - Gas Operations analyzed 383 cases – 9% (11 injuries and 22 Near Hits from CAP) were SIF exposure.¹⁴⁶
 - Electric Operations SIF exposure was 17.7% (21 injuries and 42 Near Hits).¹⁴⁷
- An Enterprise Working Group was established in January 2016. Company-wide decision tree factors were established in mid-2016 to determine whether an event was considered SIF potential and PG&E more specifically defined SIF Actual and SIF Potential.¹⁴⁸
- As of the end of 2016, SIF checklists and the incorporation of SIF into job packets had not yet occurred.
- **Exhibit X-24** provides the number and reporting source for SIF Actual and SIF Potential events from January – September 2016.

Exhibit X-24
SIF Actual and Potential
January – September 2016 [Note 1]

Source	SIF - Actual	SIF - Potential	Total
Injury - Not OSHA		3	3
Near Hit Severity Level 1		1	1
Near Hit Severity Level 2		2	2
Near Hit Severity Level 3		1	1
Non-SEMS Near Hit		17	17
OSHA Recordable		6	6
OSHA-LWD	1	4	5
Self-Care		4	4

¹⁴³ IR 191

¹⁴⁴ DR 456

¹⁴⁵ Power Generation SIF Prevention Presentation. Included SEMS data from 2008-2014 and 2014 Near Hit data

¹⁴⁶ DR 583 Attachment 001 - CONFIDENTIAL

¹⁴⁷ DR 583 Attachment 001 - CONFIDENTIAL

¹⁴⁸ DR 408 Supplement 001

Source	SIF - Actual	SIF - Potential	Total
Total	1	38	39

Note 1: SIF Actual and Potential events taken from SEMS, CAP and other LOB spreadsheets/ databases. Timing should be considered in evaluating data maturity. PG&E is establishing a procedure for tracking all SIF actual and potential incidents in a single database. MVIs are also scheduled to be tracked in 2017.

Source: DR 456 Attachment 001

- SIFs (and SIF potentials) are evaluated using a causal evaluation process: fatalities and SIF-related lost time injuries receive an RCE; recordable injuries and near hits receive an ACE.¹⁴⁹ As of September 2016, SIF reviews are to be led by the respective LOB unless it was a serious incident in which case, SH&E would lead the causal evaluation.¹⁵⁰
- Currently there are 23 SIF checklists associated with 23 identified SIF exposures which will be included in the Guardian observation tool.¹⁵¹ The intent is that the checklists will be used in tailboards, job planning, JSAs/JSSAs, the development of employee handbooks and in incident investigation.¹⁵² As of late 2016, the practice had not yet been rolled out to the field. A feedback loop regarding the decision tree process and checklists had not yet been established.¹⁵³
 - The identified SIF exposures include such items as motor vehicles, live electrical work, confined spaces, animal attack/bite, helicopter or watercraft use, dig-ins, public safety, work at heights and suspended loads and rigging.
 - Each of the 21 exposures has an associated checklist of activities to mitigate the potential effects. As an example, for confined spaces the JSSA should identify all hazards, a valid permit must exist, a rescue plan communicated, employees have documented training in confined space entry, air is tested with a calibrated monitor, confined space adequately ventilated, etc.
- In 2016, PG&E began tracking SIF-related metrics: SIF Exposure Percent, SIF Exposure Count, and SIF Timely Corrective Actions Completed.¹⁵⁴ There is no benchmark or other baseline data against which to compare performance.
- The goal is that by the end of 2017 SIF assessment teams will be operational and SIF Checklists, as well as verification of their use, will be institutionalized into everyday work procedures.¹⁵⁵

¹⁴⁹ DR 004, Supplement 001, Attachment 008

¹⁵⁰ DR 466

¹⁵¹ IR 192, DR 583 Attachment 5

¹⁵² Power Generation SIF Prevention Presentation. Included SEMS data from 2008-2014 and 2014 Near Hit data

¹⁵³ IR 193

¹⁵⁴ DR 666 Attachment 3

¹⁵⁵ DR 583 Attachment 007

10. Specific measures of individual program effectiveness do not exist for most safety-related programs and initiatives. Absent these measures and adequate cost tracking, it is difficult to weigh the relative costs and benefits of specific programs in the face of potential affordability concerns.¹⁵⁶

- PG&E does not separately track the costs of many of its safety programs/initiatives.
- The Near Hit Program is measured based on the number of submittals. While this may increase employee and organizational awareness it does not determine whether these submittals are beneficial in minimizing incidents. Volume-based targets, particularly if incented, are easy to achieve and do not guarantee the quality of the submittals. As the volume of submittals increases so does the workload. NorthStar is unaware of any restrictions on reporting. Reported near hits are not restricted to work events.
- Employees are encouraged to report CAP items when in doubt. As the volume of CAP submittals increases so will the review time and, absent additional staffing, so will the backlog. Long resolution times could create the perception that the items are not being addressed. Currently, PG&E routinely monitors backlog levels and completion times.
- The Gas LOB monitors CAP operations and human performance-related issues on a weekly basis for significant increases in volume. Upper and lower control limits are identified for each category.¹⁵⁷
- The SIF Prevention Program is in its infancy. Metrics include: SIF exposure percent, SIF exposure count, SIF timely corrective actions completed, number of employee SIFs and number of public SIFs. These metrics were not tracked prior to 2016.¹⁵⁸

D. RECOMMENDATIONS

1. Evaluate the adequacy of the information captured by various incident tracking systems (SEMS, CAP) to ensure it is sufficient to understand the causes of incidents, perform trending analyses and other analytics, and provide timely information. Improve CAP, near hit and incident tracking and reporting systems to increase the clarity of the information, ensure the appropriate level of causal evaluation has been assigned and that all required actions have been taken before an item is closed.
2. Track the costs and relative safety benefits of the CAP and Near Hit Programs. Increase efficiencies or modify programs as warranted.
 - Continue to monitor CAP backlogs and response times. The Nuclear Industry acknowledges the potential administrative burden associated with Corrective Action

¹⁵⁶ Note: These programs are not unique to PG&E and benefits are difficult to quantify.

¹⁵⁷ DR 061 Attachment 004

¹⁵⁸ DR 666 Attachment 003

Programs and other issues associated with excess reliance on CAP reporting including the following:¹⁵⁹

- Shift by station leaders from individual coaching and other programs to reliance on CAP for work tracking or low-level issues.
 - Trending all performance issues through CAP instead of considering alternatives.
 - Resource intensive causal evaluations performed when not required.
 - Excess corrective actions and additional reviews of low risk items in the interest of risk avoidance.
- Improve efficiency of CAP and Near Hits programs as workload levels increase.
 - Share efficiency improvements and best practices made by DCCP and Gas Operations with other LOBs.
 - Clarify the types of items that should be classified as CAP or near hits, versus other reporting system.
 - Consider alternative reporting mechanism for certain low risk, trend items.
 - Potentially eliminate non-work items from the near hit reporting or providing further clarification as to what should be considered a near hit.
3. Develop an evaluation program to maximize the benefits from CAP and Near Hit Reporting.
- Perform ongoing quality and compliance reviews of the following:
 - Accuracy of the categorization of the submittal.
 - Assigned priority level.
 - Consistency with procedural requirements.
 - The selection of a causal evaluation type (for near hits) and documentation of the decision-making process.
 - Quality and timeliness of the casual evaluation.
 - For CAP, the quality and timeliness of communications to submitters, notifying them the notification has been received and notifying them of the action(s) taken/resolution.
 - Quality and timeliness of the corrective actions taken and the communication of root causes and corrective actions to ensure appropriate communications have taken place and the correct audience has been notified.
 - Engage Internal Audit to perform periodic assessments of CAP and the Near Hit Reporting Program.
4. Develop an evaluation program for Serious Incident Investigations to include periodic audits of the processes by Internal Audit.

¹⁵⁹ Nuclear Energy Institute Efficiency Bulletin 16-10 “Reduce Cumulative Impact from the Corrective Action Program, March 17, 2016.

5. Improve documentation of corrective actions for incidents and near hits subject to a WGE, as well as for incidents subject to an ACE and RCE. At a minimum, documentation should include:
 - The process/rationale by which the causal evaluation type was selected (i.e., RCE, ACE or WGE).
 - A description of the corrective action, due date, completion date, responsible party and actions taken.
 - If the incident warrants a 5-minute meeting, tailboard or other communication within a workgroup, LOB or to multiple LOBs, such communication should be included as well as the date and evidence that it was communicated.
 - Where effectiveness evaluations are required, the results should be linked to the causal evaluation documentation.
6. Report and track incidents in a consistent manner such that appropriate information may be shared across the enterprise. Develop a central repository for this information which should include an executive summary, corrective actions taken, any materials developed and the effectiveness evaluations.
7. Develop a protocol involving concise, targeted, timely communications to notify other crews, work locations and LOBs of incidents or corrective actions that are applicable to that group.
8. Develop a single, consistent enterprise causal evaluation standard combining Utility Standard: SAFE-1004S (Serious Investigation Standard)¹⁶⁰ and the Enterprise Causal Evaluation Standard (Utility Standard: GOV-6102S).¹⁶¹ Incorporate the following improvements:
 - Determine whether RCEs should be required for: 1) an injury involving inpatient hospitalization for a period in excess of 24 hours for other than medical observation; and, 2) a loss of any part of the body (including eye), or any serious degree of permanent disfigurement (includes tissue damage without loss of bone).
 - Require documentation of the rationale for the selection of the CE type for all incidents, including near hits.
 - Requires assignment of responsibility for ensuring all corrective actions are thorough, appropriate, have been completed and have been appropriately communicated.
 - Requires assignment of responsibility for ensuring that the effectiveness evaluation has been completed, is thorough and any findings have been effectively addressed.

¹⁶⁰ DR 757 Attachment 001

¹⁶¹ DR 203 Attachment 001

- Include a process flow/timeline that extends to the completion of the effectiveness evaluation, similar to that included in Utility Standard: SAFE-1004S Publication Date: 05/31/2015, Rev: [1].¹⁶²
 - Provide a summary to all employees of the cause and corrective actions taken/to be taken once an incident investigation is complete (ACE/RCE). All PG&E employees are notified via email within 24 hours of the incident providing a brief summary of the incident. There is no such requirement for closure. NorthStar's review of safety-related communications to all employees evidenced the initial notification and the lack of any commensurate notification upon completion of the investigation.¹⁶³
9. Compare all LOB CE Standards to ensure the processes are consistent and all required elements are defined. As an example the Power Generation Procedure includes a discussion of the WGE process. Electric T&D and Gas Operations procedures do not. Gas Operations procedures do not include an RCE process timeline and appear to group RCE and ACE. The RCE communications plan for all procedures should include the communications process for follow-up on the Effectiveness Review Plan. Establish guidelines for communication of the corrective actions and the effectiveness reviews, as these are currently tracked separately by LOB.¹⁶⁴

¹⁶² Included in DR 495 Attachment 001

¹⁶³ DR 066 all Attachments and DR 066 Supplement 001 all Attachments.

¹⁶⁴ Procedures provided in Attachments to DR 495

XI. CONTRACTOR SAFETY

This chapter examines PG&E's contractor safety program. PG&E's contractor safety program covers all LOBs that use contractors: Gas Operations, Electric T&D, Power Generation, IT, S&SS, and Customer Care. NorthStar's assessment focuses on contractor safety in three LOBs: Gas Operations, Electric T&D, and Power Generation (primarily hydro). As shown in **Exhibit XI-1**, these LOBs had over 75 percent of the contractors in the contractor safety program in 2015 and 2016.

Exhibit XI-1
Number of Prime Contractors in Contractor Safety Program Scope by LOB
2015 and 2016 (thru 12/3/2016)

LOB	Number of Prime Contractors	Percent of Contractors
Electric T&D	775	35%
Generation	489	22%
Gas Operations	434	19%
Operating LOB Total	1,698	76%
Safety & Shared Services (S&SS)	199	9%
Information Technology	125	6%
Customer Care	115	5%
Other	90	4%
Two Year Total	2,227	100%

Source: DR 658 Attachment 1.

A. BACKGROUND

PG&E uses contractors for numerous activities, ranging from vegetation management to the installation of gas mains. An overview of contractor work in Electric T&D, Gas Operations and Power Generation is as follows:

- **Electric Transmission** typically uses contractors to supplement internal resources or for work outside of its capabilities such as boardwalk replacements, installation of new steel structures for overhead lines, new underground lines, and right-of-way work.¹
- **Electric Substation** contracts out its civil construction work, the assembly and installation testing of new power transformers, and most of the work on in-service transformers. Currently contractors perform about 70 percent of the electrical activities to build, add-on, or replace high voltage substation equipment.²

¹ DR 075 Attachment 1

² DR 075

- **Electric Distribution** typically uses contractors to supplement internal crews as the volume of the portfolio of work fluctuates.³
- **Gas Operations** uses contractors for construction work when resource needs exceed the internal construction resources or where specific skills, training, or tools are required. Examples include major backbone transmission projects, Non-Destructive Examination (NDE) and compressor station rebuilds. Gas Operations typically does not contract O&M work unless it requires specific skills, training, or tools not normally identified within the PG&E workforce. Examples of contracted O&M work include vegetation management, in-line-inspections, hydro-testing, and cross-bore sewer inspections.⁴
- **Power Generation** uses contractors for work when resource needs exceed the internal resources or when PG&E does not have the expertise or specialized skills for the work. Examples of contractor work include blasting, dive operations and inspections, or design-build work (such as turbines or other powertrain equipment.)⁵

PG&E is implementing an enhanced contractor safety program, driven by the requirements of the settlement of the Commission-ordered investigation into a 2012 fatality at the decommissioned Kern Power Plant (Kern OII)). As described in the Commission decision approving the Kern OII settlement (D.15-07-014), the settlement is built upon PG&E's acknowledgement that established law prohibits it from delegating to an independent contractor responsibility for compliance with Commission safety rules and regulations governing activities that are a necessary part of its business as an owner and operator of utility facilities.⁶ The 2015 settlement required PG&E to implement a corrective action plan on a company-wide basis that includes a Contractor Safety Program and an Enterprise Causal Evaluation Standard. The causal evaluation process is discussed in **Chapter X: Safety Reporting/Corrective Action**.

PG&E Contractor Safety Standard

PG&E's Contractor Safety Standard, first issued March 31, 2015, established the minimum requirements for contractor and subcontractor pre-qualifications, field safety observations and performance appraisals. The Contractor Safety Standard applies to contractors and subcontractors in all PG&E LOBs that perform "medium" or "high" risk work. Each LOB is responsible for determining the risk levels of its contractors based on the scope of work to be performed in accordance with the Contractor Safety Standard as summarized in **Exhibit XI-2**.⁷

³ DR 075

⁴ DR 084

⁵ DR 099

⁶ Kern Investigation_Final-Dec_CPUC_20150723_D-15-07-014_342837.pdf

⁷ DR 519.

Exhibit XI-2
PG&E Contractor Risk Categories

Risk Category	Examples of Work Scopes or Work Activities	Primary Triggers
Low Risk	<ul style="list-style-type: none"> • Consulting, classroom training • In-office engineering, design, inspection • Project Management Office (PMO) services • Basic landscaping services such as lawn mowing, trimming, and pruning (no trenching or excavating) • Manufacturing materials off PG&E premises • Material delivery off PG&E premises (Shipping) • Transportation of materials (limited to Material Handling off-site to PG&E premises) • DOT Regulated Services • Surveying, field inspection, construction management, engineering, design services that DO NOT include the primary trigger elements for higher risk work 	<ul style="list-style-type: none"> ▪ Performs NO work activities covered in the Medium/High risk definitions. ▪ Does NOT require ANY of the pre-requisites covered in the Medium/High risk definitions. ▪ Does NOT require OSHA safety and health programs to address specific criteria identified below under high and medium risk definitions, including any OSHA-required training, to mitigate task and location specific hazards.
Medium Risk	<ul style="list-style-type: none"> • Excavating and trenching less than 4 feet deep (includes hand digging) • Geotechnical investigation, potholing, drilling, boring, horizontal directional drilling • Surveying, field inspection, construction management, engineering, design services that require specialized PPE • Material handling (on/off loading materials using mechanical electric or pneumatic equipment) • Hazardous chemicals transport and handling • Compressed natural gas (CNG)/liquefied natural gas (LNG) handling 	<ul style="list-style-type: none"> ▪ Requires OSHA safety and health programs, including OSHA required training, to mitigate task and location specific hazards ▪ Work requires advanced or specialized PPE, beyond hard hat, safety boots, safety glasses and reflective vest. Examples: personal fall arrest/restraint system, respirator, rubber gloves, ear plugs/ hearing protection, FR clothing, Electrical Hazard EH boots, Energy Control Locks, Tyvek suit, etc.

Risk Category	Examples of Work Scopes or Work Activities	Primary Triggers
High Risk	<ul style="list-style-type: none"> Excavation & trenching over 4 feet (includes hand digging) Heavy equipment operation (crane, fork lift, front loader, backhoe, bobcat, bucket truck, aerial lift, boom lift, skidder) Underwater diving operations Aviation operations (helicopter, fixed wing) Demolition/blasting/explosive work Utility tree trimming, clearance work, vegetation management Environmental remediation work, asbestos abatement, hazardous material disposal/treatment/transportation, contaminated soil General construction activities such as framing, sawing, cutting, welding, boring, blasting, coating, grinding, roofing, commercial painting, electrical/gas installation, scaffolding, civil work Traffic control flagging Pesticide, herbicide application Armed security services Welding and/or hot tapping of gas lines Live-line/energized electrical work Conductor stringing/sagging removal Fault protection/grounding Radiological handling activities 	<ul style="list-style-type: none"> Work requires specialized training, formal training, licensing, certification or qualification. Examples: HVAC, Industrial Lift Truck, Permit Required Confined Space Training, Fall Protection Training, Crane Operator certification, pest control applicators license, FERC/NERC training, etc. Work directly exposes contract employee(s) to the hazards associated with the other work. Examples: Suspended load spotters, aggregate haulers where delivery of materials requires operating equipment traffic control flaggers, technical services consultants that need to enter a permit require confined space or work at heights needing fall protection, etc.

Source: DR 519, Attachment 1 Contractor Safety Bulletin SAFE-3001B, 8/5/2016. The Contractor Safety Standard Bulletin clarifies adherence requirements to PG&E's "Utility Standard: SAFE-3001S Contractor Safety Standard."

Kern OII Settlement

A timeline of Kern OII PG&E's contractor safety settlement requirements is shown in **Exhibit XI-3**.

Exhibit XI-3 Kern OII Contractor Safety Action Items

PG&E Action	Date
The new Contractor Safety Standard becomes effective.	July 23, 2015
Incorporate enhanced standard contract terms to address contractor safety into all new contracts that have high or medium risk contractor safety tasks included in the scope of work.	July 23, 2015
The PG&E Enterprise Causal Evaluation Standard becomes effective.	July 23, 2015
PG&E to provide to SED a sample LOB contractor oversight procedure for comment and review.	March 1, 2015
The LOBs will approve procedures to implement the Enterprise Causal Evaluation Standard.	May 19, 2015 to June 22, 2015

PG&E Action	Date
The LOBs will implement the procedures for the Enterprise Causal Evaluation Standard.	December 31, 2015
Prequalification of all high and medium safety risk contractors under the contractor safety program will be completed.	December 31, 2015
Each LOB will develop and approve contractor oversight procedures.	December 31, 2015
SH&E will develop and implement a process to “flag” contractors and capture lessons learned so they can be shared across the enterprise.	December 31, 2015
Prequalification of all high and medium risk subcontractors under the contractor safety program will be completed.	December 31, 2016
Incorporate enhanced standard contract terms to address contractor safety into all existing contracts that have high or medium risk contractor safety tasks included the scope of work.	December 31, 2016
Each LOB will implement its contractor oversight procedures.	December 31, 2016

Source: D.15-07-014 Attachment 5, DR 504 Attachment 1, DR 495 Attachments 2 to 8, NorthStar Analysis.

Overview of PG&E’s Contractor Safety Program

According to PG&E, there are four key elements of its enhanced contractor safety program: Pre-Qualification Process, Enhanced Contract Terms, Oversight Procedures, and Post-Job Evaluation. Each of these areas is described below.

1. **Pre-Qualification Process.** On an annual basis, contractors submit safety information to a third-party administrator. Required information includes: 1) safety performance; 2) experience modification rate (EMR, a metric used by insurance companies to gauge past cost of injuries and future chances of risk); 3) written safety programs and procedures; and 4) a completed safety culture questionnaire.

PG&E’s Contractor Safety Program requires contractors to provide a project-specific safety plan for high-risk work. Safety plans for high-risk work must address the training qualifications and staffing plans for the contractor’s safety professionals who will oversee the project and include a level of detail sufficient to allow qualified PG&E staff to assess the risk of the project. The contractor may be required to provide full-time safety oversight based on the pre-determined associated risks. For higher risk work, more oversight may be determined appropriate. Elevated frequency of oversight, such as full-time oversight, could be appropriate for the highest risk work, such as demolition activities involving explosives.⁸

2. **Enhanced Contract Terms.** Contract terms hold the contractor accountable for safety. Terms include incident reporting protocols, requirements for causal evaluations for fatalities and serious injury, and a well-defined scope with job hazards identified.

⁸ DR 185

The enhanced contract terms are posted at www.pge.com/contractorsafety. The contract terms are incorporated by reference into all general conditions forms approved for use in PG&E contracts via the following clause that appears in the PG&E Requirements section of the general conditions:

“CONTRACTOR SAFETY PROGRAM: Contractor represents and warrants that it will perform all applicable Work, and cause all Subcontractors to perform all applicable Work, in compliance with PG&E’s Contractor Safety Program Standard Contract Requirements, as may be modified from time to time. The Contractor Safety Program Standard Contract Requirements can be located and downloaded at: www.pge.com/contractorsafety and are hereby incorporated by reference into this Contract. Contractor’s failure to comply with the Contractor Safety Program Standard Contract Requirements shall be immediate grounds for termination for cause under this Contract.”⁹

The enhanced contract terms are based on PG&E’s Contractor Safety Standard, and specify:

- Contractor and subcontractor pre-qualification requirements.
- Safety incident investigations and compliance with PG&E’s Causal Evaluation Standard.
- Safety requirements for work, including:
 - Performing all work in a manner that safeguards persons and property from injury.
 - Training all contractor and subcontractor personnel on all of PG&E’s Contractor Safety Program, the contractor’s safety program, all job related hazards, and all safety laws, rules, regulations, or requirements applicable to the work.
 - Inspecting all materials, tools, equipment, and facilities for safety.
 - Requiring all Contractor and Subcontractor personnel performing work on behalf of PG&E, on either PG&E or customer sites and assets to be fit for duty and comply with the drug and alcohol programs of both PG&E and, if applicable, the DOT.
 - Cooperating with PG&E to determine applicable PG&E and regulatory requirements and appropriate control measures to eliminate or mitigate hazards specific to the work.
 - Using appropriate job hazard analysis methods for identifying and communicating known or potential hazards to its personnel and other potentially impacted workforces prior to commencing work.
 - Maintaining effective oversight of work crews to ensure compliance with PG&E and regulatory safety requirements for its personnel and other workforces under its direct control.

⁹ DR 201 and www.pge.com/contractor safety

- PG&E rights with respect to safety, including:
 - Reviewing and approving all contractor and subcontractor work plans and work-specific safety requirements.
 - Designating safety precautions in addition to those in use or proposed by the contractor.
 - Verifying that the contractor and subcontractors have effectively planned for eliminating or controlling work hazards that may impact the safety or health of PG&E and contractor personnel or the general public.
 - Requiring the contractor to provide additional safeguards beyond what the contractor plans to use.
 - Conducting and documenting field safety observations and inspections.
 - Stopping work to ensure compliance with safe work practices and applicable federal, state and local laws, rules, and regulations.
 - Suspending, terminating, or placing a contractor on probationary status in the event of a safety incident or failure to comply with these program requirements.
 - Evaluating contractor and subcontractor safety performance periodically during performance of the work and at the conclusion of the work.¹⁰
3. **Oversight Procedures.** Each PG&E operating LOB has developed contractor oversight procedures that include the following requirements:
- Only pre-qualified contractors may perform work.
 - Contractor's safety plan must be reviewed for hazard identification and mitigation prior to execution of work. Review performed by Corporate Safety or the LOB.
 - Contractors must use appropriate job hazard analysis methods to identify and communicate known or potential hazards to their employees prior to commencing work.
 - Only qualified PG&E employees or third party experts can provide safety oversight.¹¹
4. **Post-Job Evaluation.** PG&E performs a performance evaluation at the completion of every project, or annually for multi-year projects. In 2016, PG&E began to track this information, and plans to use it as part of the contractor's qualification process.¹²

PG&E Organizations Responsible for Contractor Safety

Each LOB is responsible for safety oversight of its contractors, including the following activities:

- Verification of contractor pre-qualification
- Site and job hazard identification and mitigation
- Approval of contractor safety plans
- Review contractor adherence to safety plans
- Field safety observations

¹⁰ www.pge.com/contractorsafety 1/1/2107

¹¹ DR 198 Attachments 2 and 4; DR 435 Attachment 1

¹² DR 199

- Contractor performance evaluations.¹³

The contractor safety organizations and staff responsibilities differ among the various LOBs. In general, the LOBs have inspectors, crew leads, foremen and/or safety specialists who are responsible for the oversight of contractor safety in the field, and the recording of field observations.

In 2014-2015, PG&E established a Corporate Contractor Safety group in the S&SS Department to oversee the implementation of the Contractor Safety Standard throughout the company, including assessing each LOB's implementation of the Contractor Safety Standard and management of the contractor safety program third-party administrator.¹⁴

Contractor Safety Prequalification and Performance Tracking

PG&E employs a contractor safety management third-party administrator to support the contractor safety program. In 2013, PG&E hired PICS Auditing, LLC, to manage the pre-qualification process and to provide an electronic repository of contractor safety pre-qualification data, but changed to ISNetworkworld (ISN), effective April 2015.¹⁵ Through ISN, PG&E currently manages the safety pre-qualification of approximately 1,870 prime and sub-contractors.¹⁶

ISN's Health, Safety and Environment (HSE) Review and Verification Services (RAVS) team consists of safety, procurement, and insurance professionals who review the information submitted by contractors to ensure that they are compliant. There are four ISN professionals dedicated to PG&E.¹⁷ ISN services include:

- Validating and verifying OSHA citation history.
- Reviewing OSHA injury logs to calculate injury rates, and comparing them to industry rates through the Bureau of Labor Statistics.¹⁸

PG&E ISN users include Electric T&D, Gas Operations, S&SS, IT, Customer Care, and Power Generation, as well as representatives from the Sourcing Department and Safety Organization who have direct contact or oversight of work that falls within the scope of the Contractor Safety Program (i.e., all work associated with prime and subcontractors that provide medium and/or high risk services on PG&E's sites or assets.) Examples of end-users with access to ISN and contractor information include, but are not limited to, Project Managers, Safety Specialists, Sourcing Specialists, Project Controls Analysts, and Field Engineers.¹⁹ In 2016, there were 704 active PG&E ISN users.²⁰

¹³ DR 198 Attachments 2 and 4; DR 435 Attachment 1

¹⁴ DR 426

¹⁵ DR 063 - CONFIDENTIAL

¹⁶ DR 643 Supplement 1 Attachment 1

¹⁷ IR 047

¹⁸ DR 063 - CONFIDENTIAL

¹⁹ DR 063 - CONFIDENTIAL

²⁰ DR 643 Supplement 1 Attachment 1

In addition to using ISN to manage contractor/subcontractor pre-qualification, PG&E plans to use the ISN system to manage communication, the sharing of lessons learned, and the tracking of contractor performance (e.g., injuries, safety incidents, and post-job performance evaluations).²¹ ISN is available as a smartphone App, so field personnel and safety specialists can access ISN data when needed.

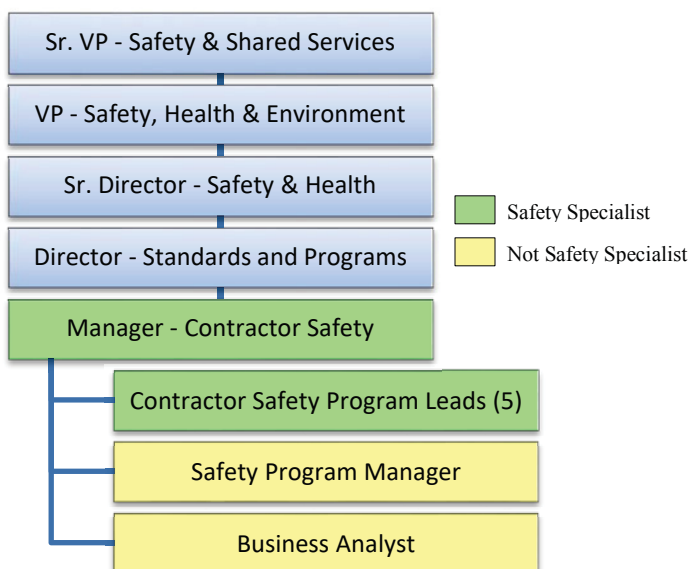
B. EVALUATIVE CRITERIA

- Does PG&E have an appropriate contractor safety program?
- Does PG&E comply with the requirements of its contractor safety program?
- How does senior management monitor safety of PG&E's contractors?

C. FINDINGS AND CONCLUSIONS

1. **The Corporate Contractor Safety group is properly executing its responsibilities to oversee the implementation of the Contractor Safety Standard and is adequately staffed with personnel with safety experience.**
 - PG&E established the Corporate Contractor Safety group in 2014 with limited staffing. It hired a Manager for this group in 2015. The group was fully staffed with eight employees by early 2016. The current organization, which reports to the Director Standards and Programs, up to the SVP S&SS, is shown in **Exhibit XI-4**.

Exhibit XI-4
Corporate Contractor Safety Organization



Source: DR 1 Supplement 1.

²¹ DR 063 - CONFIDENTIAL

- Each of the Program Leads is responsible for a geographic region and partners with the LOB Leads in his/her respective territory to mentor and provide guidance on the Contractor Safety Program requirements. The Program Leads also assess LOB adherence to the Contractor Safety Standard, applicable procedures and regulatory requirements. Assigning Contractor Safety Program Leads to geographic regions, rather than to LOBs, facilitates site visits and other interactions with field personnel.
- The Safety Program Manager manages the ISN contract, communicates the contractor safety requirements and guidance to the LOBs, and develops procedures and processes.
- The Business Analyst researches the contractor status in ISN, analyzes grade assessments, processes pre-qualification variance requests and performs data analysis.²²
- The Corporate Contractor Safety group has significant safety experience:
 - The Manager – Contractor Safety has over 20 years of safety and risk management and leadership experience, is a Certified Safety Professional (CSP) and has a Certificate in Safety Management from the American Society of Safety Engineers.²³
 - Each of the Program Leads has several years' safety experience. Four of the five leads are certified by the Board of Certified Safety Professionals, either as a CSP, or a Certified Health and Safety Technician.²⁴
 - NorthStar interviews with selected Program Leads indicate that they are passionate about safety and helping to ensure the safety of contractors.²⁵
- In 2016, the Corporate Contractor Safety group conducted several regular meetings to discuss contractor safety program elements, including the following:
 - Corporate Contractor Safety Team Weekly Calls – to discuss program updates and raise questions regarding procedures, client requests, and miscellaneous personnel issues.
 - Corporate Contractor Safety Team Monthly Meetings – to discuss program status as well as team building elements such as team training or individual presentations of current projects or work products.
 - Contractor Safety Alignment Meeting - a weekly LOB alignment call between the Program Manager for Contractor Safety and the leads from each LOB that uses contractors.
 - Individual team members from Corporate Contractor Safety also routinely meet with clients from the various LOBs.²⁶

²² DR 504 Attachment 1

²³ DR 649 Attachment 1

²⁴ DR 649 Attachments 2 to 6

²⁵ IR 147 and IR 160

²⁶ DR 504

- Although the LOBs implemented their contractor safety procedures by the end of 2016, Corporate Contractor Safety team responsibilities will remain the same in 2017. The Contractor Safety team will continue managing the third-party administrator, ISN, overseeing the contractor pre-qualification process, and partnering with all the PG&E LOBs to perform on-going assessments to ensure compliance.²⁷

2. In 2016, the Corporate Contractor Safety organization took steps to introduce and explain the contractor safety program to PG&E LOBs and contractors. NorthStar’s interviews with contractors and PG&E personnel indicate the program is well-accepted by all parties and has improved on-site safety awareness.

- The Corporate Contractor Safety Program Leads conducted a series of “road shows” to present an overview of the Contractor Safety program to the LOBs.²⁸
 - In early summer 2016, PG&E held a series of safety forums for contractors. Over 800 contractors attended. Topics included:
 - Overview of contractor safety program
 - OSHA recordkeeping
 - How to improve safety culture
 - ISN requirements and help desk sessions.²⁹
 - In May 2016, the Corporate Contractor Safety organization also facilitated a contractor safety culture best practices roundtable for over 25 global design, engineering and construction companies. The day-long meeting included group discussions of best practices in contractor safety programs, safety culture, risk measurement, “cascading” the safety program to subcontractors, and the use of technology to enhance contractor safety.³⁰
 - NorthStar’s interviews with contractors and PG&E personnel indicate the program is well-accepted by all parties and is believed to have improved on-site safety awareness.³¹
- 3. The Corporate Contractor Safety organization has appropriate processes to facilitate and review the implementation of contractor safety at PG&E; however, the quality of the assessment is diminished as the LOB, rather than Corporate Contractor Safety, selects projects for review, and the project team receives advance notice of the Contractor Safety Lead’s site visit and assessment.**
- Corporate Contractor Safety has a documented process for the Safety Leads to assess the LOB’s implementation of their contractor safety procedures.³²

²⁷ DR 684 and DR 846

²⁸ DR 388

²⁹ DR 322 Attachment 1

³⁰ DR 390 Attachment 1

³¹ Various Field Interviews

³² DR 385 Attachment 1

- The LOBs notify Corporate Contractor Safety when projects can be reviewed and Corporate Contractor Safety then arranges the reviews. The LOB has advance notice of the Contractor Safety Lead's site visit and assessment, which may influence the results.
- The end-to-end process includes verification that:
 - Contractors/subcontractors complete the ISN pre-qualification process.
 - Contractors have an acceptable pre-qualification status, or have an active variance or emergent work approval with the implementation of required mitigations.
 - Contract Terms and Conditions include Contractor Safety Program Requirements.
 - Contract Scope of Work is well-defined and clearly communicates the work objective(s).
 - PG&E-specific hazards are communicated prior to commencement of work.
 - A safety Plan is in place for high-risk work (the LOB Contractor Oversight Procedure may also require a safety plan for medium-risk work) and was reviewed for adequacy by a qualified PG&E representative.
 - Contractors perform a JHA to identify and communicate known or potential hazards to their employees or other potentially impacted workforces prior to commencing work.
 - Work is performed safely and in accordance with all regulatory and PG&E-specific safety requirements. The Corporate Contractor Safety Leads visit work sites to assess the safety of work practices
 - Personnel familiar with job hazards and safety requirements are assigned to monitor contractors and subcontractors for safety compliance.
 - LOB PG&E site representatives responsible for overseeing contractor/subcontractor work activities are performing and documenting job-site safety observations.
 - Post-job evaluation process is implemented for contractor/subcontractor safety performance.³³
- The LOBs were required to implement their contractor safety procedures by the end of 2016. During NorthStar's review Corporate Contractor Safety tracked each LOB's implementation status for the basic elements of the contractor safety process:
 - Pre-qualification
 - Contract terms
 - Statement of work
 - Hazard identification
 - Safety plan
 - Contractor oversight
 - Post-job evaluation.³⁴

³³ DR 385 Attachment 1

³⁴ DR 383 Supplement 1

- The LOB contractor safety assessments are documented on a Contractor Safety Implementation Assessment Form and emailed to the LOB. The emails highlight non-conformances, opportunities for improvement, or noteworthy practices.³⁵
- NorthStar reviewed a sample of contractor safety implementation assessments and found the reviews to be informative and properly address contractor safety at the site. The reviews documented the Corporate Safety Leads' recommendations and the contractors' actions to comply with the safety requirements. Some representative excerpts are listed below:
 - I am not quite clear on how they are training their crews. For example, when I asked [Contractor's] Safety Coordinator who conducts their training on fall protection, he responded by saying that the training is performed internally. During their tailboard brief, I noticed one of their crew members not wearing their fall protection harness correctly. After the tailboard I corrected the issue and addressed the importance of properly inspecting and donning on a fall protection harness.³⁶
 - I asked to see a few days of JSAs, Safety Briefs, and Equipment Checklists. They could not produce them but they did provide me with their morning documentation. When I raised the issue to their Safety Coordinator, he mentioned that he was bringing them new forms and that the crews had run out of the equipment checklists. I informed them that it's important to forecast these types of issues so that important aspects to safety such as equipment inspections don't go undocumented.³⁷
 - [Contractor] has made great strides with their company and employees regarding safety.... scheduling OSHA 10 safety training with either on-line or classroom training for his foreman. They have hired a third party safety consulting company to complete an overview of the safety IIPP documents, EMR, OSHA 300 logs, safety manuals, etc. They will be conducting safety observation from this third-party within the next two weeks. They have begun JHA's and tail boards for their employees every morning, with minor issues as far as clarification purposes when to conduct the meetings.³⁸
 - A very well run project with open lines of communication, all parties (LOB & Contractor leadership) were cognizant of project safety requirements, contractor oversight procedures & were genuinely concerned about safety, health & environmental issues.³⁹
 - [Contractor] continues to be proactive with their approach to safety. LOB partner identified areas for improvement with respect to the pre-inspection process for identifying hazard trees in a work span.⁴⁰

³⁵ DR 385 Attachment 2

³⁶ DR 386 Attachment 25

³⁷ DR 386 Attachment 25

³⁸ DR 386 Attachment 3-CONFIDENTIAL

³⁹ DR 386 Attachment 5

⁴⁰ DR 386 Attachment 19

4. Although PG&E amended its contracts to include enhanced contract terms regarding contractor safety, its contracts still state that the “Consultant is solely responsible for performing the Work in a Safe Manner.”

- The “enhanced contract terms” regarding contractor safety did not replace previous contractual language. No other changes were made to contracts related to contractor safety.⁴¹
- Despite PG&E’s acknowledgement in the Kern Settlement that established law prohibits it from delegating responsibility for compliance with Commission safety rules and regulations to an independent contractor, its current contract terms continue to state that “Consultant is solely responsible for performing the Work in a safe manner”⁴²
- Prior to the addition of the Contractor Safety Program language, contracts contained the following language that still remains in PG&E’s current General Conditions templates:

“IMPORTANCE OF SAFETY: Consultant recognizes and agrees that safety is of paramount importance in the performance of the Work and that Consultant is solely responsible for performing the Work in a safe manner. Consultant shall plan and conduct the Work, and shall require all Subcontractors to perform their portion of the Work, in accordance with Consultant’s safety program and with all applicable local, state and federal rules, regulations, codes, and ordinances to safeguard persons and property from injury. Consultant further agrees to provide necessary training to its employees and Subcontractors to inform them of the foregoing safety and health rules and standards. Should PG&E at any time observe Consultant, or any of its Subcontractors, performing the Work in an unsafe manner, or in a manner that may, if continued, become unsafe, then PG&E shall have the right (but not the obligation) to require Consultant to stop the Work affected by the unsafe practice until Consultant has taken corrective action so that the Work performance has been rendered safe.”⁴³
[Emphasis added]

5. The PG&E/ISN prequalification process is an effective approach to screening contractors based on their safety records and documented safety policies and programs. ISN performs a desktop review of the information submitted by the contractors.

- PG&E’s safety prequalification for high and medium risk contractors is a two-step process.

⁴¹ DR 753

⁴² Kern Investigation_Final-Dec_CPUC_20150723_D-15-07-014_342837.pdf

⁴³ DR 753

- First, a contractor must meet the prequalification criteria based on its safety record, as shown in **Exhibit XI-5**. PG&E developed these criteria based on industry benchmarking conducted in 2013.⁴⁴

Exhibit XI-5
PG&E Contractor Safety Pre-Qualification Criteria

Targets (Based on year to year performance)	Acceptable	Not Acceptable
Number of Fatalities within the last five years	0	1 or more
Experience Modification Rate (EMR) most recent year certificate (EMR is a metric to gauge past cost of injuries and future chances of risk)	≤ 1.10	> 1.10
Confirmed (Closed) Serious/Willful/Repeat OSHA Citations within the last three years	0	> 0
Total Recordable Incident Rate (TRIR) within the last three years for industry as determined by the North American Industry Classification System (NAICS) code (TRIR reflects the number of OSHA recordable incidents per hours worked)	≤ industry average (by NAICS code)	> industry average (by NAICS code)
DART Rate within the last three years for industry NAICS code	≤ industry average	> industry average

Source: DR 519 Attachment 1.

- If a contractor meets the prequalification criteria, ISN grades the contractor in accordance with **Exhibit XI-6**. Contractors must have an acceptable grade based on its safety program and statistics.

Exhibit XI-6
Scorecard Point Breakdown

Component	Points	Description
SH&E Cultural Questions	20	Questions in the areas of health and safety, drug and alcohol, subcontractor management, environmental, accident/incident reporting, and union information. These questions pertain to assessing a contractor's safety culture by validating that specific safety improvement and safety-focused policies are in place to influence a positive safety culture. Responses to graded questions tally for an overall score for this component.
Safety Performance Statistics	30	Questions regarding historical safety performance information, such as a three-year history of injury rates, OSHA Citations, Mining Safety and Health Administration Citations, and a five-year history of fatalities and serious safety incidents (SSIs) that involved the general public.
EMR	10	EMR is a metric used by insurance companies to gauge both past cost of injuries and future chances of risk. The lower the EMR, the lower the worker compensation insurance premiums.

⁴⁴ DR 347

Component	Points	Description
Written Safety Programs	30	Contractors are required to have written safety programs to mitigate the hazards associated with their specific Scope of Work with PG&E. These written programs are evaluated for compliance with state and federal OSHA requirements.
Contractor Performance Appraisal Form [Note 1]	10	These evaluations, submitted by PG&E field and project teams, document and track the safety performance of contractors performing medium-risk and high-risk work activities on PG&E projects.
Total	100	

Note 1: PG&E does currently include post-job assessments in its screening process as the post-job assessment program was just implemented in 2016.

Source: DR 183.

- ISN compares contractors' safety performance to industry averages using the North American Industry Classification System (NAICS) code to determine the appropriate industry benchmark.
 - Each contractor identifies and reports its industry-specific NAICS code in the ISN system during the registration process.
 - The ISN system generates comparative data for injury rates by referencing the Bureau of Labor Statistics industry averages set by each NAICS code.
 - This process allows PG&E to compare a contractor's three-year history of injury rates to its own industry's three-year injury rate averages.⁴⁵
- There is an incentive for contractors not to report all safety incidents, as the safety records impact their safety score. This concern is mitigated by ISN's review and verification of the contractor-submitted information as part of its RAVS process:
 - Health and Safety Program Review – Desktop review of contractor/supplier written health and safety programs to assess compliance with key federal and/or PG&E specific standards and legislation.
 - Injury and Illness Statistics – Annual verification of contractor/supplier incident and safety performance statistics against OSHA 300 and 300A forms.
 - EMR – An annual verification of contractor/supplier EMR against insurance documentation.
 - Citation Verification – Citation verification through OSHA, EPA and MSHA public access citation/inspection databases. Bi-annual searches are completed and findings are reported to PG&E.⁴⁶

6. PG&E appropriately requires approval from the VP-SH&E to use high and medium-risk contractors with unacceptable safety records to perform unique or emergency work. Approval requires specific mitigation plans to ensure contractor safety performance.

- The sum of the points based on the criteria listed in **Exhibit XI-6** results in an overall scorecard grade of A, B, C, or F, as shown in **Exhibit XI-7**.

⁴⁵ DR 184

⁴⁶ DR 196 Attach 3 - CONFIDENTIAL

Exhibit XI-7 ISN Scorecard Grade

Grade	Details	Low Range	High Range
A	Recommended for Use	90	100
B	Acceptable	80	<90
C	Variance Request	70	<80
F	Variance Request	0	<70

Source: DR 183 Attachment 3.

- The LOBs must provide a variance request for justification when requesting a pre-qualification variance for contractors with a “C” or “F” grade from ISN.
 - Contractor must provide a unique service or is needed to perform emergency (emergent) work due to an urgency associated with an asset failure or operational need. In both situations, there must be no other approved contractors reasonably available to perform the work.
 - There is a formal variance request process.
 - The LOB VP requests the variance. Documentation for the variance request includes:
 - A mitigation plan or a safety improvement plan specific to the safety performance area(s) of concern.
 - Sourcing VP’s written concurrence that no other contractors are available and that they are approving the request for SH&E VP consideration.
 - LOB VP’s business justification and written concurrence that the contractor provides critical or unique services and that they approve the request for SH&E VP consideration.⁴⁷
 - The SH&E VP grants or denies the variance request, following consultation with the LOB VP(s) and Sourcing VP.⁴⁸
 - If a variance request is approved, the approval is valid until March 31st of the following year. This is shortly after the annual OSHA 300/300A logs are received, verified by ISN, and applied to the contractor’s grade.⁴⁹
- 7. PG&E performed root cause evaluations of contractor SSIs (life altering/life threatening or a fatality) that have occurred since the Causal Evaluation Standard was issued in May 2015.**
- PG&E’s Contractor Safety Standard defines an SSI as “[a]n incident resulting in a Life-Threatening or Life-Altering Injury, or a fatality, to the public, employees or

⁴⁷ DR 427 Attach 1

⁴⁸ DR 427 Attach 1

⁴⁹ DR 427 Attach 1

contractors resulting from work on or caused by a failure or malfunction of PG&E facilities.”⁵⁰

- An SSI is similar to a Serious Injury or Fatality (SIF actual), as used in PG&E’s SIF Prevention Program.
- The differences between a SIF actual and an SSI are: 1) the SSI definition covers incidents involving contractors and members of the public, while SIF actual does not, and 2) a SIF actual event can be unrelated to work on or caused by a failure or malfunction of PG&E facilities so long as the SIF occurred while the employee or contractor was working (e.g., an employee fatality while driving a company vehicle for work purposes).⁵¹
- PG&E’s Causal Evaluation Standard requires that all contractor SSIs resulting from work on or caused by a failure or malfunction of PG&E facilities undergo an RCE. Prior to the publishing of this standard on May 11, 2015, this requirement did not exist.⁵²
- ISN is not involved in this process.⁵³
- **Exhibit XI-8** is a summary of PG&E Contractor RCEs since May 11, 2015.

Exhibit XI-8 **PG&E Contractor Root Cause Evaluations**

Date	Contractor Name	Description	Does PG&E Have RCE?
10/2/2015	Hot Line Construction	PG&E contractor Hot Line Construction employee received induction shock while working overhead on Newark-Tassajara 230kV. Contractor sustained small puncture wounds to his index fingers and was admitted overnight at hospital for observation and released back to full duty the next day.	Yes
12/30/2015	Wright Tree Service of the West	PG&E tree trimming contractor fell from the tree approximately 50' while doing post-storm tree removal in the Hoopa/Orleans area. No electric contact and no wires down.	Yes
12/1/2016	Utility Tree Service (subcontractor ArborWorks)	PG&E tree trimming subcontractor fatality while doing drought-related vegetation work in Mariposa County.	In process

Source: DR 761 Supplement 001 Attachment 001, DR 496 Attachment 001-CONFIDENTIAL
<https://ibew1245.com/2016/12/05/local-1245-tree-trimmer-dies-in-work-accident>.

8. PG&E communicates lessons learned from contractor SSI investigations to PG&E management and to its contractors.

- In 2015, Corporate Contractor Safety issued a documented process for sharing contractor lessons learned. According to PG&E, the objectives of the program are:

⁵⁰ DR 536 Attachment 1

⁵¹ DR 757

⁵² DR 761

⁵³ DR 759

- To implement a process that prevents adverse incidents and shares good work practices within PG&E enterprise-wide.
- To provide for the systematic review, identification, collection, screening, evaluation, and dissemination of operating experience (including lessons learned) from internal and external sources.⁵⁴
- PG&E uses ISN to communicate safety lessons learned events to PG&E contractors. In response to a data request, PG&E provided two examples of such communication - one example involves a PG&E contractor fatality and the other a PG&E employee fatality. In both cases, the communication was distributed initially to PG&E management and then a redacted version was distributed to all PG&E contractors registered in ISN.⁵⁵
- PG&E's process for implementing lessons learned may include revising procedures and work practices; modifying facilities and equipment; identifying and disposing of defective items; entering the issue into CAP; and incorporating lessons learned into training curriculum, as applicable.⁵⁶ As described in its written process, PG&E's contractor safety lessons learned process is implemented at three levels:
 - The first level is in the immediate work area where lessons are first identified, learned, and applied.
 - The second level includes the development and distribution of institutional-level lessons learned, such as lessons learned bulletins, Safety Flash bulletins, and 5-Minute Meetings that communicate lessons that are learned from within PG&E and external to PG&E.
 - The third level includes management communication of, and response to, the more significant operating events.⁵⁷

9. PG&E requires contractors to report SSIs that involve a member of the general public. A contractor-reported SSI triggers an ISN Action Item requiring the contractor to provide information regarding the incident for PG&E's review. PG&E has no formal criteria to close the SSI action items.

- SSIs reported in ISN are based on contractor responses to the following question "in [year x], how many Serious Safety Incidents (SSIs) did your company have that involved a member of the general public?" This reporting requirement was agreed upon in the Kern OII settlement and is intended to provide a tool for PG&E to receive information on SSIs involving members of the public, for work performed by PG&E contractors, regardless of whether the contractor was working for PG&E at the time the SSI occurred.⁵⁸

⁵⁴ DR 655 Attachment 4

⁵⁵ DR 655

⁵⁶ DR 655 Attachment 4

⁵⁷ DR 655 Attachment 4

⁵⁸ DR 758

- Contractor self-reported SSIs are reported through ISN and are received weekly by PG&E's Contractor Safety team in a summary report.⁵⁹
 - A contractor-reported SSI triggers an ISN Action Item which requires the contractor to provide information regarding the incident for PG&E review and potential follow up.
 - These action items are initially assigned automatically to the contractor that reported the incident, but can be assigned manually when necessary.
 - Only PG&E can close a contractor-assigned SSI Action Item.⁶⁰
- PG&E has not established formal criteria to close an SSI action item, but has closed SSI action items after the following actions were completed:
 - Contractor provides supporting documentation about the incident, which PG&E reviewed and found to be sufficient in order to provide a qualitative analysis of the incident.
 - Some contractors reported incidents that PG&E determined did not qualify or meet the definition of an SSI affecting the public. In these cases, PG&E validated and noted the mistake in the comment section of the action item before closing the item.
 - Contractor mistakenly reported an SSI in the ISN system.⁶¹
- PG&E does not perform causal evaluations for SSIs involving contractors unless the work is performed for PG&E.⁶²
- Since April 2015, contractors have reported 24 SSIs in ISN. PG&E Corporate Safety has closed 19 of these items.⁶³
- PG&E receives information on SSIs that occur during PG&E-contracted work through means other than ISN in accordance with safety incident reporting requirements outlined in each LOB contractor safety oversight procedure.
 - The contract terms and conditions in PG&E's contracts with its service providers include a specific contractual requirement to "immediately inform PG&E of all safety incidents that occur during the performance of Work on PG&E Assets by Contractor or any Subcontractor."⁶⁴

⁵⁹ DR 656

⁶⁰ DR 063 - CONFIDENTIAL

⁶¹ DR 758

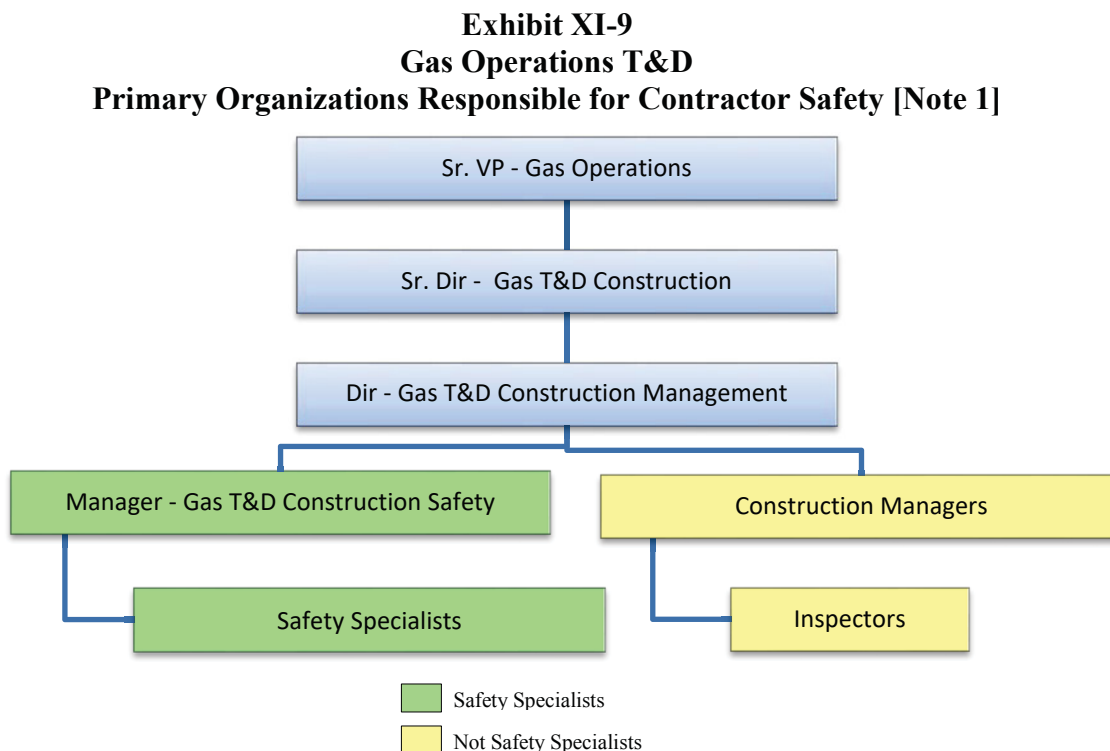
⁶² DR 759

⁶³ DR 656 Attachments 2 – 11

⁶⁴ DR 536

10. The Gas Operations T&D Construction Management organization has an established contractor safety process with dedicated safety specialists for work with Gas Operations T&D contractors.

- The primary Gas Operations organizations responsible for contractor safety oversight are shown in **Exhibit XI-9**.



Note 1: This Exhibit shows organizations responsible for safety oversight of the Gas Operations' T&D contractors. As discussed in Conclusion 11 below, there are also Safety Champions responsible for contractor safety in other Gas Operations organizations.

Source: DR 1 Supplement 1.

- The Gas T&D Construction Management – Safety organization supports contractor safety for the Gas Operations T&D contractors. This organization of eleven is focused full time on contractor safety.⁶⁵ The Gas Construction Safety Specialists include both contractor and PG&E personnel.⁶⁶ The Safety Specialists are assigned by region and responsible for:
 - Field safety observations
 - Review of the site specific safety plans
 - Safety incident investigations
 - Raising safety awareness.⁶⁷

⁶⁵ DR 589

⁶⁶ DR 001 Supplement 001

⁶⁷ IR 201

- PG&E assigns inspectors to each contractor-performed gas construction project. These inspectors generally are not certified safety professionals.
 - Gas Operations inspectors assess whether contractors adhere to applicable PG&E Gas guidance documents (standards and procedures), project drawings and specifications, and applicable regulations and permits.
 - The number of inspectors and level of inspection is determined according to project risk and specific work stream.
 - The role of these inspectors is to monitor, evaluate, verify, discuss, resolve, report, and document pipeline construction activities to ensure public and worker safety.⁶⁸
 - Lead inspectors are currently contractors. Craft inspectors (e.g., review of welding or coating) are PG&E employees who are working towards becoming Lead Inspectors.⁶⁹
 - The number of Construction Managers and Inspectors varies based on work load. Contractors are used to supplement PG&E employees when necessary.⁷⁰

11. Other Gas Operations' organizations are in the process of establishing contractor safety programs, and these programs were not yet addressed in a documented procedure as of October 2016.

- Each Gas Operations organization that uses contractors has a Safety Champion that is responsible for the implementation of the contractor safety standard.⁷¹ Current Safety Champions are listed in **Exhibit XI-10** below.

Exhibit XI-10
Gas Operations Safety Champions

Department	Job Title
Gas T&D Construction Management	Manager, Gas T&D Construction Safety
Gas T&D General Construction	Superintendent, Gas T&D General Construction
Gas Storage Asset Management	Supervisor, Gas Reservoir Specialist
Land Management	Manager, Special Projects
Gas Pipeline Operations & Maintenance	Superintendent, T&D Pipeline Operations and Maintenance
Gas T&D Maintenance & Construction	Superintendent, Gas T&D Maintenance and Construction

Source: DR 506.

- In 2016, the Director of Gas T&D Construction Management and the Manager of the Gas T&D Construction Safety began to work with the Safety Champions to implement the Gas Operations Contractor Safety Program.

⁶⁸ DR 088 - CONFIDENTIAL

⁶⁹ IR 201

⁷⁰ IR 201

⁷¹ DR 504

- Since July 2016, the Gas Operations Safety Champions have participated in biweekly conference calls with the Gas T&D Construction Safety department. The purpose of the calls is to share best practices, obtain updates on implementation progress, and check-in with the safety champions to see where they may need help or further support.
- The safety champions receive regular communications to provide updates to the program and job aids to help them better perform their assigned function.⁷²
- Safety Champions are not addressed in the Gas Operations Contractor Safety Procedure.⁷³

12. Gas Operations is taking steps to foster communications and other aspects of safety culture with the Gas T&D unit cost contractors.

- The PG&E Manager, Safety, Gas Construction Management holds a monthly Contractor Safety Forum for its contractors and representatives from other PG&E departments including Construction Management and Quality Management. NorthStar attended the August 2016 meeting and observed good communication regarding safety issues among the contractors and between the contractors and PG&E, including the following discussions:
 - Incident root cause analysis -- The incident was discussed without blame, and there was good conversation about what could be done to prevent similar incidents and what PG&E resources are available to help the contractors. The PG&E Manager thanked the contractor for allowing the incident to be shared so all could learn.
 - The need for PG&E QA, PG&E Safety Representatives, PG&E Inspectors, contractors, and the CPUC to be consistent in their interpretation of PG&E safety requirements.
- Gas Operations includes contractors in its Good Catch Program. The Good Catch Program is proactive approach to identify safety or quality issues that include stopping any unsafe or non-quality work or activity and coaching a fellow team member. Any “good catch” is documented on a Good Catch Form. The best “good catches” are discussed in the monthly Contractor Safety Forum and in the weekly all-hands Gas Operations safety meeting.⁷⁴

13. Power Gen (Hydro) has had an established contractor safety program for several years and has inspectors assigned full-time to each contractor job, who are supported by a safety specialist.

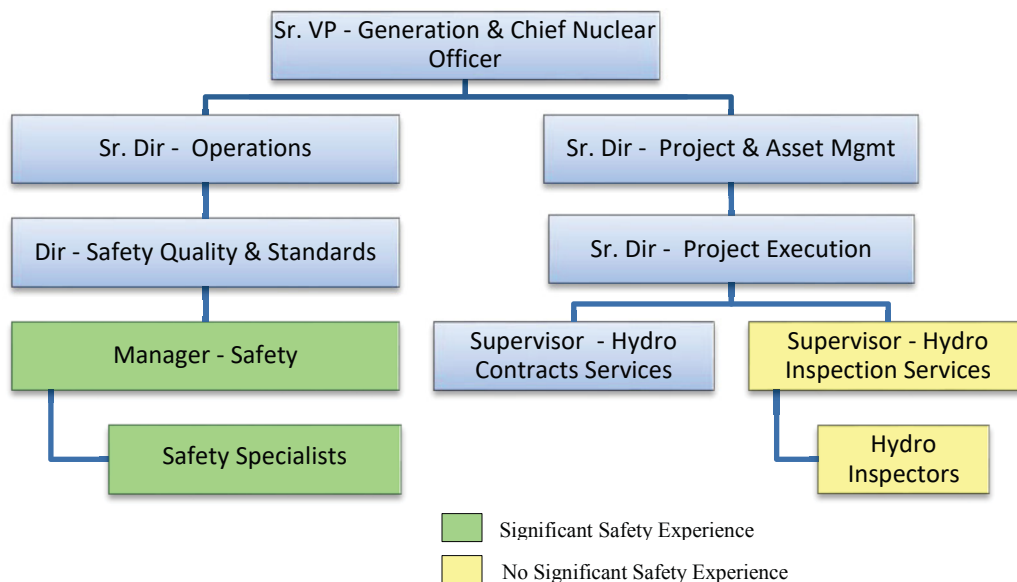
- The principal Hydro Power Generation organizations responsible for contractor safety oversight are shown in **Exhibit XI-11**. Specific responsibilities for contractor safety are discussed in Conclusion 16.

⁷² DR 594

⁷³ DR 435 Attachment 1

⁷⁴ August 2016 Contractor Safety Forum

Exhibit XI-11
Primary Organizations Responsible for Contractor Safety
Hydro Power Generation



Source: DR 001 Supplement 1, DR 091 Attachment 1, DR 520 Attachment 1, Interviews 95, 155 and 186.

- Power Generation has had a contractor safety program and procedure in place since 2009 and hydro inspectors have played a role in contractor safety for several years. As a result of the Kern settlement, changes to the procedure in 2015 increased the focus on safety rather than administrative responsibilities.⁷⁵
- Hydro currently has one safety specialist who is responsible for contractor safety as well as for the capital work performed in-house.⁷⁶ Power Generation is evaluating assigning a safety specialist to support contractor safety on a full-time basis.⁷⁷
- Hydro Inspectors are assigned full-time to every contractor job. They are responsible for ensuring the contractors follow the site-specific safety plans, conduct tailboards, and follow safe practices. Along with the safety specialist, they are also responsible for field observations.⁷⁸

⁷⁵ IR 186. NorthStar did not review Power Generation Contractor safety procedures issued prior to 2015.
 Generation

⁷⁶ DR 101

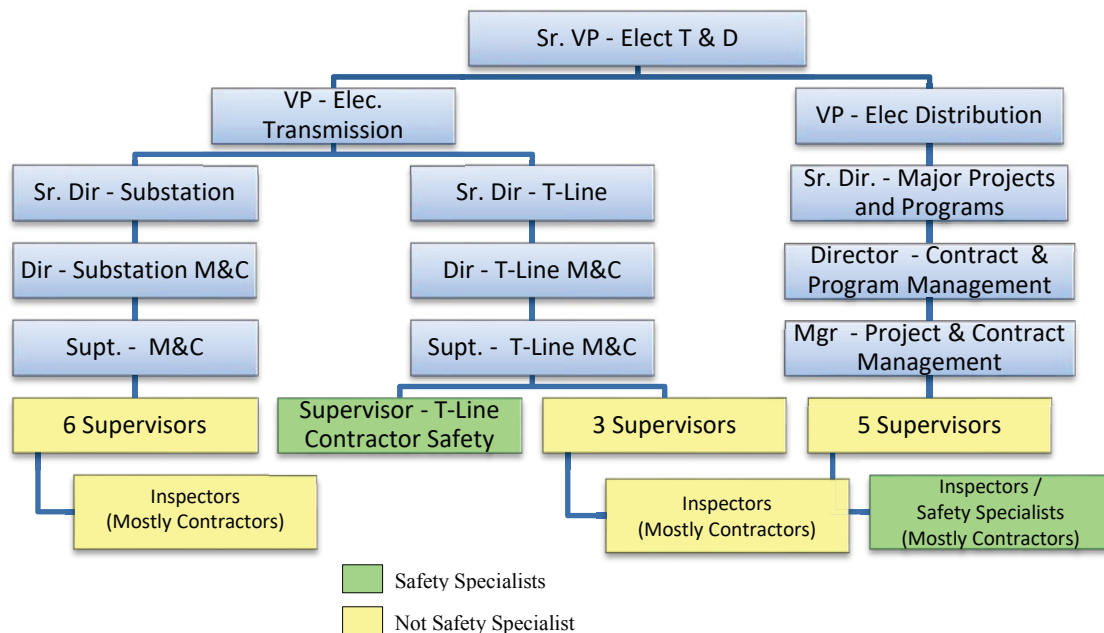
⁷⁷ DR 589

⁷⁸ DR 101

14. Electric T&D did not begin to implement its contractor safety program until 2016 and the program was not fully implemented during NorthStar’s review. Transmission, Distribution and Substation have different organizational approaches to contractor safety.

- The primary organizations responsible for Electric T&D’s contractor safety are shown in **Exhibit XI-12**. Specific responsibilities for contractor safety are discussed in Conclusion 16.

Exhibit XI-12
Primary Organizations Responsible for On-Site Contractor Safety Oversight
Electric T&D – July 2016



Source: DR 1 Supplement 1.

- Electric T&D has separate organizations for transmission, distribution and substation work. Although these organizations all use the same Electric T&D Contractor Safety Procedure they have different approaches to staffing contractor safety.

Electric Distribution

- At the time of NorthStar’s review in late summer 2016, Electric Distribution had just begun to implement the Contractor Safety program. According to PG&E, one of the first steps in the program, the development and communication of the site-specific safety plans greatly increased safety awareness.⁷⁹
- In Electric Distribution, inspectors review the quality of contractors’ work. Five supervisors oversee the work of about 50 inspectors, most of whom are all retired

⁷⁹ IR 150

PG&E employees who now serve as contractors. The number of inspectors varies based on workload.⁸⁰

- On-site safety inspections are conducted by third-party Safety Inspectors, the Work Supervisor, or a qualified third-party consultant.
 - Five Safety Inspectors oversee contractor safety. Safety Inspectors are QEWs who are OSHA-trained and, according to PG&E, have safety-related experience.⁸¹
 - Work Supervisors provide additional safety inspection support on jobs where safety inspectors have reported repeated safety issues. All Work Supervisors receive OSHA 30-Hour Construction training.⁸²
 - Work Supervisors perform periodic inspections and ensure the Safety Inspectors have completed their inspections manner and the contractors are following their Site-Specific Safety Plan (SSSP).⁸³
 - Safety Compliance Management (SCM), a third third-party consultant provides infrequent, supplemental inspections by certified safety professionals.⁸⁴

Electric Transmission and Substations

- Electric Transmission hired a supervisor for contractor safety in January 2016. The Supervisor T-Line Contractor Safety is a safety specialist who currently has no direct reports.⁸⁵
- Electric Substations does not have a separate contractor safety organization.
- In both Electric Transmission and Substations, inspectors are responsible for oversight of contractor safety.
 - Inspectors are responsible for day-to-day contractor safety observations and oversight for both electric transmission line and substation work.⁸⁶
 - Inspectors are assigned to a job and are on-site daily.⁸⁷
- The Supervisor T-Line Contractor Safety, along with a Substation Supervisor, developed and implemented the contractor safety process for transmission and substation work in 2016.
- The Supervisor T-Line Contractor Safety, has taken additional steps to implement the contractor safety program in Electric Transmission, including:

⁸⁰ IR 150

⁸¹ DR 558 and DR 696. NorthStar did not independently verify the safety inspector qualifications.

⁸² DR 558

⁸³ DR 558

⁸⁴ DR 558

⁸⁵ DR 1 Supplement 1 and IR 216

⁸⁶ IR 216 and DR 204

⁸⁷ IR 204

- Developing a standard template for the project risk assessment, performed by the Planning group.
- Reviewing project risk assessment for inclusion in contractors' bid packages.
- Socializing the contractor safety program with transmission line contractors.
- Promoting the contractor safety culture through meetings with prime contractor's senior leadership and safety personnel and crew visits.⁸⁸
- During a site visit, NorthStar observed that the PG&E Supervisor, T-Line Contractor Safety, the PG&E inspector and the contractor's on-site safety representative all pointed out safety concerns. In addition, the contractor safety representative commented that both PG&E's and the contractors' commitment to safety has greatly increased in the past year, and there is a reduction in the "we vs. them" mentality.⁸⁹

15. Many of the inspectors responsible for contractor safety in Electric T&D do not have adequate safety experience or training; Electric T&D is developing contractor safety web-based training courses for these inspectors.

- As previously shown in **Exhibit XI-12**, many of the inspectors responsible for contractor safety in Electric T&D are not safety specialists.
- As a part of Electric T&D's new Contractor Safety Procedure, Substation, T-Line, and Distribution are working together to develop web-based training about contractor safety standards and procedures that will be required for inspectors.⁹⁰
 - The web-based training courses are being developed with the intent to be available for the inspectors on a flexible schedule. These courses are expected to be available by the middle of next year.
 - There are also instructor-led courses for the inspectors that are currently available from the PG&E Learning Academy.⁹¹
 - **Exhibit XI-13** is a summary of required Electric T&D contractor safety training for inspectors.

⁸⁸ IR 216

⁸⁹ IR 216

⁹⁰ DR 372

⁹¹ DR 586

Exhibit XI-13
Required Training for Electric T&D Contractor Safety Inspector Employees

	T-Line	Substation Civil	Substation Electric	Distribution
Web-Based Training Courses (Available Mid-2017)				
Inspector Qualification - Introduction	✓	✓	✓	✓
Excavation Safety	✓	✓	✓	✓
Rubber Glove Fundamentals	✓			✓
Fall Protection / Safety at Heights	✓	✓	✓	✓
Hoisting and Rigging	✓	✓	✓	✓
Instructor-Led Training (Currently Available)				
Distribution Grounding	✓			✓
Overhead Grounding Transmission	✓			
Underground Transmission Grounding	✓			
Substation/Generation Grounding Refresher		Vehicle grounding only	✓	
Substation Grounding Observer			✓	

Source: DR 586

16. For the most part, the LOB contractor oversight procedures include tasks to address all elements of contractor safety oversight; however, the assignment of tasks in the Electric T&D and Gas Ops procedures is confusing, does not always reflect the current organization, and there are some anomalies in the procedures.

- Each LOB has developed a LOB-specific contractor safety oversight procedure that establishes minimum oversight requirements for all medium and high-risk work performed. The procedures include specific requirements and responsibilities for pre-construction, construction, and post-construction activities, including:
 - Contractor pre-qualification
 - Site and job hazard identification and mitigation
 - Approval of the contractor's site or program-specific safety plans
 - Safety orientation meeting
 - Field safety observations
 - Documenting performance evaluations after the work is completed.⁹²
- There is one procedure for Electric T&D although organizational approaches to contractor safety differ between distribution, transmission and substations.
- **Exhibit XI-14** provides an overview of the key tasks and assigned responsibilities for on-site contractor safety as outlined in the Electric T&D, Gas Operations and Hydro procedures. The procedures also specify additional tasks not captured in the exhibit, such as the verification of contractor's pre-qualification status.

⁹² DR 198 Attachments 2 and 4, DR 435 Attachment 1

Exhibit XI-14
LOB Contractor Safety Oversight Tasks and Assigned Responsibilities

Task	Electric T&D		Gas Operations		Hydro Generation	
	Responsibility	Comments	Responsibility	Comments	Responsibility	Comments
Pre-Construction						
1. Develop the contractor safety requirements and determine the level of contractor oversight necessary for the work	Work Supervisor	Procedure Table - Oversight by Competent or Qualified Site Representative based on Risk	PG&E Site Representative (Inspector)	No specific guidance re: requirements	Work Supervisor	Procedure Table - Oversight by Competent or Qualified Site Representative based on risk
2. Determine field safety observations frequency	Work Supervisor	Limited guidance High Risk – “frequent”; Medium Risk “periodic”	PG&E Safety Representative (Safety Specialist)	No specific guidance	Work Supervisor	No guidance
3. Ensure that the Contractor and Subcontractors have completed all prerequisites for working	Work Supervisor	Documentation of field orientation	PG&E Site Representative (Inspector)	Contractor On-Board Modules 1,2,3	Work Supervisor	Contractor safety video Safety Plan
4. Verify that Contractors have established criteria to meet or exceed PG&E’s minimum field oversight expectations	Contract Management		Contract Management			Not addressed
5. Ensure Contractor’s Safety Plan has been reviewed	Work Supervisor		PG&E Site Representative (Inspector) and Safety Rep (Safety Specialist)	Reviewed by Construction or M&C and Safety Dept. management teams	Work Supervisor	
6. Conduct a Pre-Construction Safety Meeting for major projects	NA	Part of Construction Kick-off meeting (#10)	PG&E Site Representative (Inspector)	Meeting with PG&E and Contractor	Work Supervisor	Internal meeting with project team responsible for contractor oversight
7. Discuss results of Pre-Construction Safety Meeting with PG&E Site Representative and Contractor Safety Representative	NA	Part of Construction Kick-off meeting (#10)		NA – Contractor is at meeting	Work Supervisor	

Responsibility of Safety Representative
 Task not addressed in procedure

Task	Electric T&D		Gas Operations		Hydro Generation	
	Responsibility	Comments	Responsibility	Comments	Responsibility	Comments
Construction						
8. Conduct a thorough initial safety orientation (initial tailboard, project kickoff meeting) with the Contractor	PG&E Site Representative			Combined with Pre-Construction Safety Meeting (#6)	PG&E Site Representative	Hazard Ref Guide for Contractor Work and Contractor Safety Checklists LOTO
9. Daily tailboard meetings led by the Contractor	Site Rep/Inspector	Ensure tailboard is adequate	Site Rep	Actively Participate	PG&E Site Representative	Ensure the JSA is adequate and addresses work tasks
10. Observe the Contractor's adherence to the Contractor's Safety Plan, daily JSA, and general safe practices and immediately address deviations	Site Rep/Inspector		PG&E Safety Department staff PG&E Site Rep (Inspector)	periodically	PG&E Site Representative	Stop work if necessary. Make sure
11. Field Safety Observations						
a. Develop Field Safety Observation Criteria		Not Addressed	PG&E Safety Rep		Work Supervisor and PGE& Safety Rep	
b. Perform Field Safety Observations	Site Rep/Inspector		Worksite Team, supported by PG&E Safety Rep		Project Team in coordination with PG&E Safety Rep	Coordinate with Work Supervisor. May make unannounced visit
c. Share results of Field Safety Observations with Contractor's safety representative		Not Addressed	PG&E Site Rep Safety Rep		PG&E Site Rep Work Supervisor	
d. Address safety issues identified during Field Safety Observations		Not Addressed	Contractor's Safety Rep		Contractor's Safety Rep	Develops action plan as necessary
e. Capture and Share best practices resulting from Field Safety Observations		Not Addressed	Contractor's Safety Rep		Contractor's Safety Rep	
f. Document completion of action items resulting from Field Safety Observations		Not Addressed	PG&E Safety Rep		PG&E Site Representative	
12. Ensure SST's are investigated and corrective actions developed	Work Supervisor/ Site Rep		Not Assigned	Gives contractor notification requirements, but no responsibility for follow-up	Work Supervisor	
Post-Construction						
13. Complete and submit the Contractor Performance Appraisal Form	PG&E Site Representative (Inspector)		PG&E Site Representative (Inspector)	In Unifier	Work Supervisor	

Task	Electric T&D		Gas Operations		Hydro Generation	
	Responsibility	Comments	Responsibility	Comments	Responsibility	Comments
14. Review the results of the appraisal in the post-construction lessons learned meeting if applicable		Not Addressed	PG&E Site Representative (Inspector)		Work Supervisor	
15. Ensure that the appropriate safety-related documentation is properly filed	Work Supervisor			Into ISN at least annually	Work Supervisor	

Source: DR 198 Attachments 2 and 4, DR 435 Attachment 1, NorthStar Analysis

- As shown in **Exhibit XI-14**, for the most part, the procedures do an effective job of identifying contractor safety oversight tasks at each stage of a project, however, there are some tasks (highlighted in grey) that are not addressed in the procedures, including:
 - Electric T&D – development of field safety observation criteria, following up on field observations, lessons learned meetings.
 - Hydro – verification that contractor has criteria to meet or exceed field oversight expectations.
- A review of **Exhibit XI-14** identifies some deficiencies regarding the LOB's procedures.
 - There is no guidance regarding the frequency of field observations, other than Electric T&D's requirement for frequent (high risk) or periodic (medium risk).
 - Electric T&D does not assign any tasks to safety representatives.
 - Gas Operations does not assign any contractor safety oversight procedures to work supervisors.
 - Gas Operations assigns some responsibilities to the site representatives that the other LOBs assign to work supervisors, such as review of the Contractor's safety plan, or following up on field observations.
 - Electric T&D does assign responsibility for the development of field safety observation criteria, nor share results of field safety observations with the contractors.
- Each LOB has a different approach to the pre-construction kick-off meeting. In all procedures, the contractor safety responsibilities are assigned to work supervisors, site representatives, and safety representatives. Specific job titles associated with these roles vary from LOB to LOB, and project to project. Typical job titles associated with the contractor safety roles specified in the procedures are shown in **Exhibit XI-15**.

Exhibit XI-15
Typical Job Titles Associated with Contractor Oversight Roles

Contractor Oversight Roles	Electric T&D	Gas	Power Gen
Competent Site Representative • Oversees the safety of contractors. Has training, knowledge or experience related to work to be performed and knowledge of mitigation measures	• Inspector (Contractor) • Inspector • Qualified Electrical Worker	• Inspector • Inspector (Contractor) • Crew Lead • Construction Manager	• Hydro Inspector • Inspector (Contractor) • Construction working foreman or sub-foreman • O&M Crew lead

Contractor Oversight Roles	Electric T&D	Gas	Power Gen
Qualified Site Representative <ul style="list-style-type: none"> • Qualifications for Competent Site Representative • Has formal training in risk evaluation, safety management and incident cause evaluation • Has formal training to identify and mitigate high-risk activities 	<ul style="list-style-type: none"> • Safety Representative (this position is not defined in procedure) 	<ul style="list-style-type: none"> • Inspector • Inspector (Contractor) 	<ul style="list-style-type: none"> • Hydro Inspector
Work Supervisor	<ul style="list-style-type: none"> • Supervisor • Project Manager • Engineer 	Not used in procedures	<ul style="list-style-type: none"> • Project Manager (identified in the contract)
PG&E Safety Representative	Not defined	<ul style="list-style-type: none"> • Member of SH&E or Safety Specialist 	<ul style="list-style-type: none"> • Project Execution Safety Specialist [Note 1]

Note 1: Procedure defines the safety representative as PG&E individual recognized by degree, certification, knowledge, or experience as a health and safety subject matter expert (SME) who has decision-making authority for ensuring safety compliance, NorthStar interviews indicate this is typically the Project Execution Safety Specialist.

Source: DR 198 Attachments 2 and 4; DR 435 Attachment 1.

17. There are no documented guidelines regarding the frequency of field observations and some methods of recording field observations do not support trend analyses.

- As previously shown in **Exhibit XI-14**, the LOB contractor safety procedures give minimal guidance regarding the frequency of field observations.
- As part of the implementation of the LOB contractor safety procedures, the LOBs are developing standardized reports for contractor oversight observations.
- Gas Operations and Power Generation primarily use the Guardian observation system for contractor field observations.⁹³
 - Guardian tracks: 1) the date observed, 2) group location, and 3) observer and the safe or at-risk behaviors observed.⁹⁴
 - However, it does not record contractor data, nor have the ability to perform meaningful trend analyses.
- Electric Transmission identified limitations in the current version of Guardian, and is developing its own safety reporting tool which will contain requisite data to perform trend analysis. The tool will be used for:
 - Reporting and tracking incidents, near hits, positive contacts and infractions.
 - Frequent and periodic safety observations.
 - Daily inspector logs.⁹⁵

⁹³ DR 101 and DR 89

⁹⁴ DR 077

⁹⁵ DR 674 Attachment 3

18. PG&E supplements its contractor safety oversight with ISN's verification that the contractors actually execute their safety programs.

- ISN provides a RAVS Plus service to gather evidence that the contractors' written health and safety programs are implemented and put into practice by the contractor.⁹⁶ As outlined by ISN, there are two steps to the RAVS Plus process:
 - Document Review: Training and Supporting documentation submitted within ISN, including documents such as training rosters, inspection checklists or completed permits.
 - In-Person Interview: Discussion of program implementation between ISN and the contractor company, including the contractor's health and safety management and a field, craft or site-level representative.⁹⁷
- In 2016, 76 contractors completed the RAVS Plus process.⁹⁸ PG&E shadowed five RAVS Plus assessments for the in-person interviews. These five contractors were selected based on their company size, the hazards associated with their work, and to represent multiple Lines of Business at PG&E, including Gas Operations, Electric Transmission and Distribution, and Shared Services.⁹⁹

19. Unlike Electric T&D and Gas Operations, Power Generation does not test contractors on their knowledge of orientation materials as part of the on-boarding process.

- Exhibit XI-16 presents a summary of the operating LOB on-boarding methodologies.

Exhibit XI-16
Operating LOB Contractor On-Boarding Methodologies

LOB	Primary On-Boarding Methodology	Test?	Hardhat Stickers/Wallet Cards
Electric T&D	Orientation manual	Yes	Yes
Gas Ops	Web-based training modules	Exam after each module	Yes
Power Gen	Orientation video	No	Yes (after viewing video)

Source: DR 100 Attachment 1, DR 563, DR 372.

- Power Generation's on-boarding process includes:
 - All contractor employees are required to view Power Generation's contractor safety orientation video.
 - Contractor employee training is verified for identified project requirements.

⁹⁶ DR 428

⁹⁷ DR 428 Attachment 2

⁹⁸ DR 643 Supplement 1 Attachment 1

⁹⁹ DR 428

- Contractor employees are required to participate in lockout/tag out training if working within a clearance.¹⁰⁰
- The Electric T&D on-boarding process for contractors consists of the review of an orientation manual and written test or knowledge checks based on the information in the orientation manual.
 - Each contractor employee is required to review the manual and take a written test to prove understanding of the content.
 - PG&E issues hardhat stickers and wallet cards that contractor employees must have on hand in order to verify that they have been trained.¹⁰¹
- Gas Operations uses web-based training to on-board contractors and inspectors.¹⁰² There are 15 different modules. The required modules are dependent on the role of the individual employee, from construction flagger to inspector to lead inspector to construction manager.¹⁰³ Training modules are available in Veriforce, a third-party OQ content and administration provider.¹⁰⁴
 - All individuals must complete the training modules that address, Worksite Safety Awareness, and Gas Emergency Response Plan (GERP) Awareness.¹⁰⁵
 - Individuals must complete an exam after each module.¹⁰⁶

20. Senior management reviews contractor safety metrics in the monthly BPR meetings.

- **Exhibit XI-17** lists the end-of-year results for contractor safety metrics included in the BPR dashboards.

Exhibit XI-17
Contractor Safety Metrics included in BPR Dashboards

Metric	End of Year			
	2013	2014	2015	2016
Contractor LWD Case Rate	0.306	0.779	0.57	0.22
Contractor LWD Case Count	7			
Contractor TRIR		1.998	1.89	0.77
Contractor SPMVI Rate	1.219			
Contractor SPMVI Count	12			
Contractor SIFs				0
Contractor DART Rate		1.337	1.07	

Source: DR 666 Attachment 3.

¹⁰⁰ DR 653

¹⁰¹ DR 372

¹⁰² DR 372

¹⁰³ DR 596 Attachment 1

¹⁰⁴ DR 307

¹⁰⁵ DR 596 Attachment 1

¹⁰⁶ DR 596 all Attachments

- As shown in **Exhibit XI-17**, in 2016, PG&E began to track the number of contractor SIFs in the monthly dashboard, and removed the contractor DART rate.

D. RECOMMENDATIONS

1. Corporate Contractor Safety should select the projects for review rather than the LOBs, and conduct “surprise” field visits to assess contractor safety practices.
2. Determine whether it is feasible to update the language in contracts to remove all references to the contractor or consultant being “solely responsible” for performing work in a safe manner.
3. Develop formal criteria to close contractor SSI action items in ISN.
4. Facilitate the sharing of best practices and lessons learned regarding the LOBs’ implementation of the Contractor Safety Standard, addressing both organizational and procedural issues, including:
 - Roles of safety specialists, inspectors and work supervisors with respect to Contractor Safety
 - Benefits of a separate contractor safety group
 - Contractor safety training for safety specialists and inspectors
 - Frequency of field observations
 - Field observation data and trend analyses.

Following the determination of best practices:

- Each LOB should update its Contractor Safety procedures to reflect its current organization, clarify responsibilities and reflect best practices.
 - Corporate Contractor Safety and LOB personnel with contractor safety experience should develop or revise contractor safety training for safety specialists and inspectors.
 - Corporate Contractor Safety, or a LOB contractor safety representative, should work with appropriate PG&E personnel to update the Guardian observation tool to provide a useful tool to trend and track contractor safety performance.
5. Update LOB contractor safety procedures to clarify responsibilities and reflect current organizations and processes. Include guidelines regarding the frequency of field observations.
 6. Institute a contractor on-boarding test in Power Generation.

APPENDIX A

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ACE	Apparent Cause Evaluation
AGA	American Gas Association
AL	Apprentice Linemen
API	American Petroleum Institute
Board	Board of Directors
BOD	Board of Directors
BPR	Business Performance Review
CAP	Corrective Action Program
CARB	Corrective Action Review Board
CBA	Collective Bargaining Agreement
CCECC	Customer Contact Emergency Coordination Center
CE	Causal Evaluation
CEMI5	Customers Experiencing More Than Five Outages of one minute or more in the past year
CEO	Chief Executive Officer
CERP	Company Emergency Responsibility Plan
CFR	Code of Federal Regulations
CLP	Crew Leadership Program
CNG	Compressed Natural Gas
Commission	California Public Utilities Commission
COO	Chief Operating Officer
CPUC	California Public Utilities Commission
CRT	CAP Review Team
CSP	Certified Safety Professional
CSR	Copper Service Replacement Program
DART	Days Away from Work, Restricted Work Activity or Job Transfer
DCPP	Diablo Canyon Nuclear Power Plant
Diablo Canyon	Diablo Canyon Nuclear Power Plant
DiRT	Dig-in Reduction Team
DOT	Department of Transportation
EC&O	Engineering, Construction and Operations
EEI	Edison Electric Institute
EFO	Earnings from Operations
EK&S	Employee Knowledge and Skills
Electric T&D	Electric Transmission & Distribution
ELT	Extended Leadership Team
EMR	Experience Modification Rate
EPPM	Enterprise Portfolio Planning and Management
ERE	Event Reporting Engine
ESC	Engineers and Scientists of California
ESRB	Electric Safety and Reliability Branch
ET&D	Electric Transmission & Distribution
EVP	Executive Vice President
FAA	Federal Aviation Administration
FEA	Front-end Analysis
FERC	Federal Energy Regulatory Commission
FPC	Financial Plan Committee

Acronym	Definition
FR	Fire Retardant
FSS	Field Safety Specialists
FTC	Field Training Coordinator
FTE	Full-Time Equivalent
GC	General Construction
GE	General Electric
GERP	Gas Emergency Response Plan
GHS	Globally Harmonized System
GO	Gas Operation
GRC	General Rate Case
GRIT	Generation Risk Information Tool
GSE	Gas Safety Excellence
HAZWOPER	Hazardous Waste Operations and Emergency Response
HOIT	Hydro Operator in Training
HR	Human Resources
HSE	Health, Safety and Environment
IBEW	International Brotherhood of Electrical Workers
IMT	Incident Management Teams
INPO	Institute of Nuclear Power Operations
IPP	Integrated Planning Process
IRP	Independent Review Panel
ISN	ISNetwork
ISO	International Organization for Standardization
IT	Information Technology
LOTO	Lock Out – Tag Out
JHA	Job Hazard Analysis
JPM	Job Performance Measure
JSA	Job Safety Analysis
JSB	Job Safety Briefing
JSSA	Job Site Safety Analysis
Kern OII	Kern Order Instituting Investigation, Order to Show Cause and Notice of Hearing
Keys	Keys to Success
KPI	Key Performance Indicator
LED	Leadership and Employee Development
LNG	Liquefied Natural Gas
LOB	Line of Business
LOTO	Lock out-Tag out
LSP	Learning Solution Proposal
LTIP	Long-Term Incentive Program
LWD	Lost Work Day
M&C	Maintenance and Construction
MAT	Maintenance Activity Type
MIT	Massachusetts Institute of Technology
MOAP	Maximum Allowable Operating Pressure
MSHA	Mining Safety and Health Administration
MVI	Motor Vehicle Incident
MWC	Major Work Category
NAICS	North American Industry Classification System

Acronym	Definition
NDE	Non-Destructive Examination
NEO	Named Executive Officers
NERC	North American Electric Reliability Corporation
NorthStar	NorthStar Consulting Group
NOS Committee	Nuclear, Operations and Safety Committee
NRC	Nuclear Regulatory Commission
NRT	Notification Review Team
NTSB	National Transportation Safety Board
OCDI	Organizational Culture Diagnostic Instrument
OII	Order Instituting Investigation
OIR	Order Instituting Rulemaking
OJE	On-the-Job Experience
OQ	Operator Qualification
OSHA	Occupational Safety and Health Administration
PAL	Pre-Apprentice Linemen
PALW	Pre-Apprentice Line Workers
PAS	Publicly Available Specification
PG&E	Pacific Gas and Electric Company
PG&E Corp.	PG&E Corporation
PGST	Power Generation Safety Team
PHA	Project Hazards Analysis
PHMSA	Pipeline and Hazardous Materials Safety Administration
PMO	Project Management Office
PMVI	Preventable Motor Vehicle Incident
PPE	Personal Protective Equipment
PPM	Portfolio Planning and Management
PS&R	Public Safety & Reliability
PSEP	Pipeline Safety Enhancement Plan
psig	Pounds per square inch gauge
PSSP	Project Site Safety Plan
PV	Photovoltaic
QEW	Qualified Electric Worker
QP	Qualified Person
RAMP	Risk Assessment Mitigation Phase
RAV	Review and Verification Services
RCE	Root Cause Evaluation
REE	Reach Every Employee
RET	Risk Evaluation Tool
RIBA	Risk Informed Budget Allocation
RIN	Rapid Incident Notification
ROII	Report of Occupational Injury or Illness
RP	Recommended Practice
RSU	Restricted Stock Units
RTU	Remote Terminal Unit
S&SS	Safety and Shared Services
S-1	Session 1
S-2	Session 2
Safety Culture	I.15-08-019 Order Instituting Investigation to Determine Whether PG&E and

Acronym	Definition
Investigation	PG&E Corporation's Organizational Culture and Governance Prioritize Safety
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
S-C	Session C
S-D	Session D
SE&HS	Safety Engineering and Health Services
SED	California Public Utilities Commission Safety and Enforcement Division
SEIU	Service Employees International Union
SEMS	Safety and Environmental Management System
SH&E	Safety, Health and Environment
SIAP	Supervisor Incident Analysis Packet
SIF	Serious Injury or Fatality
SLA	Service Level Agreement
SLD	Safety Leadership Development
SLW	Safety Leadership Workshops
S-MAP	Safety Model Assessment Proceeding
SME	Subject Matter Expert
SMS	Safety Management System
SPMVI	Serious Preventable Motor Vehicle Incident
SRC	Special Review Committee of the Board of Directors
SSI	Serious Safety Incident
SSSP	Site-Specific Safety Plan
STIP	Short-Term Improvement Plan
SVP	Senior Vice President
T&D	Transmission and Distribution
TO	Transmission Owner
TRIR	Total Recordable Incident Rate
TSR	Total Shareholder Return
VP	Vice President
WBT	Web-based Training
WGE	Work Group Evaluation
WOI	Work Orientations Inventory

APPENDIX B

INCIDENT REPORTING SYSTEMS

PG&E uses a variety of systems to track injuries or incidents and to report items that could potentially affect safety. Some of these house data required for OSHA reporting and others provide additional functionality. Each of the systems is described below:

Nurse Hot Line

The Nurse's Line was established and piloted by several organizations in 2012 to replace paper form injury reporting. It was deployed company-wide in January 2013. Managed by a third-party (WorkCare), it operates 24/7 to encourage early reporting of injuries and incidents. WorkCare employees create a record for each phone call received and record pertinent information related to the event – injured caller's name, telephone contact information, details of the injury (i.e., injury sustained, body part, type or cause of the injury (strain, muscle pull, puncture, etc.) date of injury, events leading to and potentially causing injury, geographic location of injury, diagnosis, and anticipated next steps. In general, this information is forwarded electronically to PG&E's Safety and Environmental Management System (discussed below) for additional data entry and analysis. WorkCare nurses also have the ability to make call-backs to injured employees and receive follow-up phone calls from injured employees while maintaining the initial incident record. As such, an incident is tracked from its initial call through various follow-up phone calls and instructions.

Safety and Environmental Management System

The Safety and Environmental Management System (SEMS) is the "system of record" for all work-related injuries (including OSHA logs), Near Hits for selected organizations and all MVIs. SEMS was first deployed in May 2013. The sixth release was targeted for October 2016.¹ For injuries, records are created based on and initiated by a phone call to PG&E's 24/7 Nurse Hotline. Records for Near Hits and MVI's are based on self-reporting via web portals and mobile applications (over 99% of all records) and paper forms and phone reports (less than 1% of all records). Gas Operations and DCPD use the Corrective Action Program to report Near Hits. As CAP is deployed throughout all LOBS, Near Hit capability will be disabled in SEMS.²

SEMS replaced the Report of Occupational Injury or Illness (ROII), which required manual data entry originating from paper reports. As an SAP workflow tool, SEMS merely functions as a repository for the characteristic data of the various incidents (injuries, Near Hits, MVIs) and provides support for incident management tasks, including incident investigation and corrective action implementation.³ Corporate Safety owns the SEMS system. The primary users of SEMS are those individuals responsible for OSHA reporting, organizations responsible for reporting and analysis and those responsible for any aspect of safety incident management who use it to report the results of incident investigations, the completion of corrective actions and certification that corrective actions have been completed.⁴ SEMS incident types are provided in **Exhibit 1**.

¹ DR 062

² DR 881

³ IR 45

⁴ DR 062

Exhibit 1 SEMS Incident Type

Type	Description	Notification Source
Self-Care	An injury or potential injury that is resolved without requiring a visit to a doctor	Employee calls WorkCare
Injury	An injury that is resolved after one or more visits to a doctor. May be classified as First Aid, OSHA Recordable, Restricted-Duty/Transfer, LWD Serious or Fatality	Employee calls WorkCare
Serious Injury	An injury (above) that also meets OSHA and PG&E criteria for a “serious” designation	Employee or Co-worker call WorkCare Option 1
MVI	An incident involving a vehicle operated by an employee on company business. May be classified as preventable/non-preventable and serious/minor	Employee or supervisor submit an online form
Near Hit	An event reported by an employee where no one was injured but where the potential existed to injury someone. Classified as severity 1-4.	Employee submits on-line form, paper form or calls 1-800 number. Currently initially input to a variety of systems

Source: DR 062 Attachment 001.

RINS/ERE

Until November 7, 2016, the Event Reporting Engine (ERE) and the Rapid Incident Notification System (RINS) were used by Electric Transmission and Distribution Operations to report injuries, MVIs, and work procedure errors (WPEs) — now called human errors — resulting in customer outages, incidents and Near Hits.⁵ ERE is the database while RINS is the reporting platform. As such, the system is more commonly referred to as RINS by PG&E Electric Operations employees. Notifications were sent daily through e-mail informing supervisors of incidents.⁶ The following required submittal of an event report:⁷

- A generator trip or unplanned curtailment of more than 2 percent of a unit’s gross megawatt output.
- A significant problem that affects the safety of a Power Generation facility and impacts, or could potentially impact, the safety of Power Generation personnel.
- Personnel safety incidents when the incident is related to facility safety.
- An environmental deviation.
- A deviation of regulatory license or permit conditions.
- A deviation from a procedure that results in the loss of generation capacity or ancillary generation services.
- An unusual or recurrent malfunction of facility systems and equipment.
- A deviation that affects the operation, reliability, or safety of personnel or equipment in reference to applicable operating standards and procedures.

ERE’s predecessor was the ROII. PG&E sought a notification system and developed and implemented ERE in late 2012/early 2013. Use of the RINS/ERE reporting system ended on Sunday, November 6, 2016. All reporting beginning on Monday, November 7, 2016 that

⁵ RINS/ERE was an Electric Division only reporting and notification system.

⁶ IR 44

⁷ DR 214

was previously entered in the RINS/ERE database was redirected to the Enterprise Corrective Action Program (ECAP) – discussed below. It is too early to assess the transition from RINS to ECAP.

In general, RINS provided the following data for each incident. During its field observations, NorthStar observed an arc flash resulting in customer outages. No employees were injured. The incident was reported in RINS the following morning.⁸

- Event ID
- Event Date
- Time
- Status (Final or Preliminary)
- Facility Affected (asset owner)
- kV (Kilovolts)
- Control Center
- Manager Level Charged
- Director Level Charged
- Work Category
- Class

Exhibit 2 provides details of the reported Transmission incidents. **Exhibit 3** provides details of the Distribution incidents.

Exhibit 2 RINS Notifications - Transmission

Root Cause	Transmission 2013-2014		Transmission 2015		Transmission 2016 (Seven months)	
	Incidents	Percent	Incidents	Percent	Incidents	Percent
Human Failure	104	97.2%	96	78.7%	25	26.9%
Safety Incident	3	2.8%	26	21.3%	68	93.1%
Total	107		122		93	

Source: DR 214. Supplement 003 Attachments 002-004 – CONFIDENTIAL.

Exhibit 3 RINS Notifications – Distribution (2013-2016 – 43 months)

Type	Incidents	Percent
Safety Incident	973	60.6%
Customer Affected	448	27.9%
No Customer Affected	117	7.3%
Customer Affected Momentary	55	3.4%
Privileged	11	0.7%
Compliance	2	0.1%
Total	1,606	100.0%

Source: DR 214. Supplement 003 Attachment 001 – CONFIDENTIAL.

⁸ Field observations

Incidents classified as “Customer Affected” range from circuits tripping due to overload, switching errors, mapping discrepancies or fuse/cable mislabeling resulting in de-energized customers - to inadvertent contact or lost control of a hot wire. “Safety Incidents” include such things as MVIs; slips, trips and falls; sprains; dog/tick bites; heat illnesses; and contact injuries.⁹

Corrective Action Program (CAP)

The CAP program is the current repository for CAP submittals, Near Hits, Injury and MVI investigations and corrective action data. CAP submittals include equipment and safety issues, ineffective or inefficient work processes and procedures and improvement suggestions. CAP had staged deployments in the LOBs beginning in 2013, with the final deployment targeted in 2017. As of October 2016 data in SEMS has been integrated with CAP.¹⁰

⁹ DR 214

¹⁰ DR 881